

Yellowknife
(as received)

From: SC / VI (INFC)
Sent: March 7, 2019 12:00 PM
To: mauge@yellowknife.ca
Subject: Smart Cities Challenge - Successful Final Proposal Submission

Dear Mike,

Congratulations! Your submission is ready to move onto evaluation following a completeness check (per the latest FAQs).

Thank you for your cooperation, patience, and hard work, especially during the past eight months. We are truly honoured to have worked with you and wish you the best of luck in the competition!

On a related matter, we have recently determined that it will not be feasible to post final proposals on the Infrastructure Canada website in a timely manner. Instead, we will take an approach similar to the application stage and publish your executive summary in both official languages on the Infrastructure Canada website with a link to the final proposal on your website. We understand that posting the final proposal on your website is not a requirement contained in the finalist guide so we appreciate your cooperation in facilitating access to your final proposal in an open and transparent way. Please note that the accessibility materials you have prepared for your final proposal will still be helpful in preparing various communications products to promote and share knowledge of your work.

Once you have posted your final proposal on your website, please send us the link if you haven't done so already. If you anticipate that you will be unable to post your final proposal on your website within two weeks, please let us know.

As always, we are happy to answer any questions. The best way to reach us going forward would be at our generic account: infc.sc-vi.infc@canada.ca.

Thank you.

Smart Cities Challenge Team
Infrastructure Canada
infc.sc-vi.infc@canada.ca

From: SC / VI (INFC)
Sent: March 5, 2019 5:30 PM
To: mauge
Cc: sbassi-kellett@yellowknife.ca; cvaughn@yellowknife.ca; cgreencorn@yellowknife.ca
Subject: RE: Final Proposal - City of Yellowknife

Hello,

Thank you for your submission. Please consider this email as acknowledgement of receipt. We will follow up with you to confirm that your final proposal is ready for evaluation.

Thank you.

Smart Cities Challenge Team
Infrastructure Canada
infc.sc-vi.infc@canada.ca

From: mauge [mailto:mauge@yellowknife.ca]
Sent: March 5, 2019 5:00 PM
To: SC / VI (INFC) <infc.sc-vi.infc@canada.ca>
Cc: sbassi-kellett@yellowknife.ca; cvaughn@yellowknife.ca; cgreencorn@yellowknife.ca
Subject: Final Proposal - City of Yellowknife

Hello,
Please see the attached documents, the City of Yellowknife's finalist proposal for the Infrastructure Canada Smart Cities Challenge. This submission should include:

1. The Final Proposal (SCC Final Proposal V2.pdf)
2. Our Finalist Video (SCC FINAL V2.mp4)
3. Our PPIA Correspondence with the OPC (Privacy Commissioner Correspondence.pdf)
4. The Accessibility Text Descriptions for the Proposal (SCC Accessible Text Descriptions.pdf)

Please confirm receipt of this submission and if you have any difficulties accessing or downloading any of the documents, please let me know asap.

If there is anything else required to complete our submission, please let me know and I'll get it in right away.

Thanks,

Mike Auge,
P. Eng.

Manager, Sustainability and Solid Waste

COMPLETE CHECK FOR FINAL PROPOSAL

FINALIST: Yellowknife				
ASSESSED BY: Amanda Aizlewood				
VALIDATED BY: Alex Long				
APPROVAL BY: select one: Jenny Tremblay / Eric Poirier				
DATE OF COMPLETION: enter date when all completed boxes are checked				
REQUIREMENTS	COMPLETED	IF NOT COMPLETED, NOTE REASON	GUIDING PRINCIPLES	ACTIONS
SUBMISSION				
Submitted to infc.sc-vi.infc@canada.ca by 23:59 PST on March 5, 2019	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> No extensions will be granted No exceptions will be made for lateness or technical problems (finalist must be able to show evidence of submission) 	<ul style="list-style-type: none"> # to contact finalist If not resolved, # to flag to DG for decision
Final proposal is submitted	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> No extensions will be granted There is flexibility on the finalist video until the end of the week 	<ul style="list-style-type: none"> Assessor to save everything in designated folders # to contact finalist if anything is missing If not resolved, # to flag to DG for decision
Finalist video is submitted	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> There is flexibility on the finalist video until the end of the week 	<ul style="list-style-type: none"> Assessor to save everything in designated folders # to contact finalist if anything is missing If not resolved, # to flag to DG for decision
Preliminary Privacy Impact Assessment or Preliminary Rationale Analysis	<input type="checkbox"/>	No validation from NT privacy commissioner that a PPIA was not required. Submitted proof that they are in contact and meetings have taken place but no final letter confirming that PPIA is needed. NOTE: follow-up with OPC	<ul style="list-style-type: none"> No extensions will be granted 	<ul style="list-style-type: none"> Assessor to save everything in designated folders # to contact finalist if anything is missing If not resolved, # to flag to DG for decision
FINAL PROPOSAL				
Written in one of Canada's official languages	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> If the final proposal is submitted in a language other than English or French, a companion version in English or French is required from the finalist 	<ul style="list-style-type: none"> # to extract the executive summary from the final proposal and send it to translation (if a French final proposal, send the entire document to translation)
Generally readable (e.g. picture is not covering text, text are not overlapping)	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> If there are serious formatting issues that hinders readability, the finalist may need to resubmit 	<ul style="list-style-type: none"> # to do a scan of the final proposal and verify that all text and tables, graph, etc. could be read
Text-based and in either MS Word (.doc or .docx) or a fully readable, searchable, and selectable PDF (.pdf) format	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> Finalist may adjust the format for INFC posting purposes after the deadline 	<ul style="list-style-type: none"> # to verify with Comms if format is suitable for posting, given INFC web accessibility standards If not suitable, # to contact finalist
No longer than 75 pages* (Financial chapter exempted) and in 12 point font	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> Finalist cannot adjust content after the deadline If the text overall is smaller than 12 point font, INFC will adjust and 	<ul style="list-style-type: none"> # to notify finalist if final proposal is over 75 pages # to notify finalist if INFC had to adjust the font and page count

			evaluate within the new page count	
Contains an executive summary	<input checked="" type="checkbox"/>			<ul style="list-style-type: none"> # to QC and save translated version into the designated folder
Organized by these distinct chapters (not limited to these; not necessarily in the same order): <ul style="list-style-type: none"> Vision Performance measurement Project management Technology Governance Engagement Data and privacy Financial Implementation phase requirements 	<input checked="" type="checkbox"/>	<i>Also make a note of other chapters, if any</i>	<ul style="list-style-type: none"> Finalist must have these chapters Finalist can have more chapters Finalist can change the order of the chapters 	<ul style="list-style-type: none"> If the chapters are not clearly labeled, # to do a light analysis of where the content may be and make a note for the Jury
FINALIST VIDEO				
No longer than five minutes	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> Finalist may cut down the time for INFC posting purposes after the deadline 	<ul style="list-style-type: none"> # to notify finalist if video is longer than five minutes and needs cutting down
Submitted as a file or in a downloadable format	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> Finalist may adjust the format for INFC posting purposes after the deadline 	<ul style="list-style-type: none"> # to verify with Comms if format is suitable for posting, given INFC web accessibility standards If not suitable, # to contact finalist
CONFIDENTIAL ANNEX (OPTIONAL)				
Submitted if and only if required	<input type="checkbox"/>	No confidential annex		<ul style="list-style-type: none"> # to flag with DG if confidential annex is lengthy

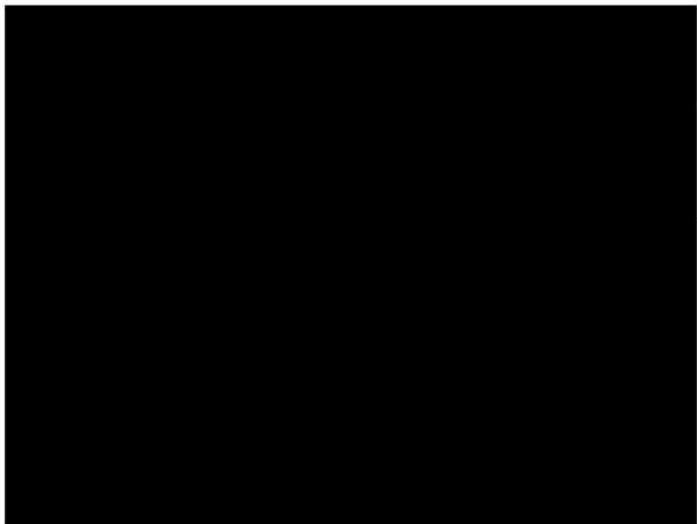
Public Works and Engineering

City of Yellowknife

T: 867.669.3404

yellowknife.ca

Files attached to this message

Filename	Size	Checksum (SHA1)
SCC Final Proposal V2.pdf	106 MB	
SCC FINAL V2.mp4	192 MB	
Privacy Commissioner Correspondence.pdf	373 KB	
SCC Accessible Text Descriptions.pdf	97.5 KB	

Please click on the following link to download the attachments:

This email or download link can be forwarded to anyone.

The attachments are available until: **Sunday, 10 March.**

Message ID: [REDACTED]

ATIA - 19(1)

LiquidFiles Appliance: [REDACTED]

ATIA - 13(1)(d)

• EXTRAORDINARY •
YELLOWKNIFE

SMART CITIES PROPOSAL

Infrastructure Canada's Smart Cities Challenge



**FINAL
PROPOSAL**
MARCH 5, 2019



CITY OF YELLOWKNIFE

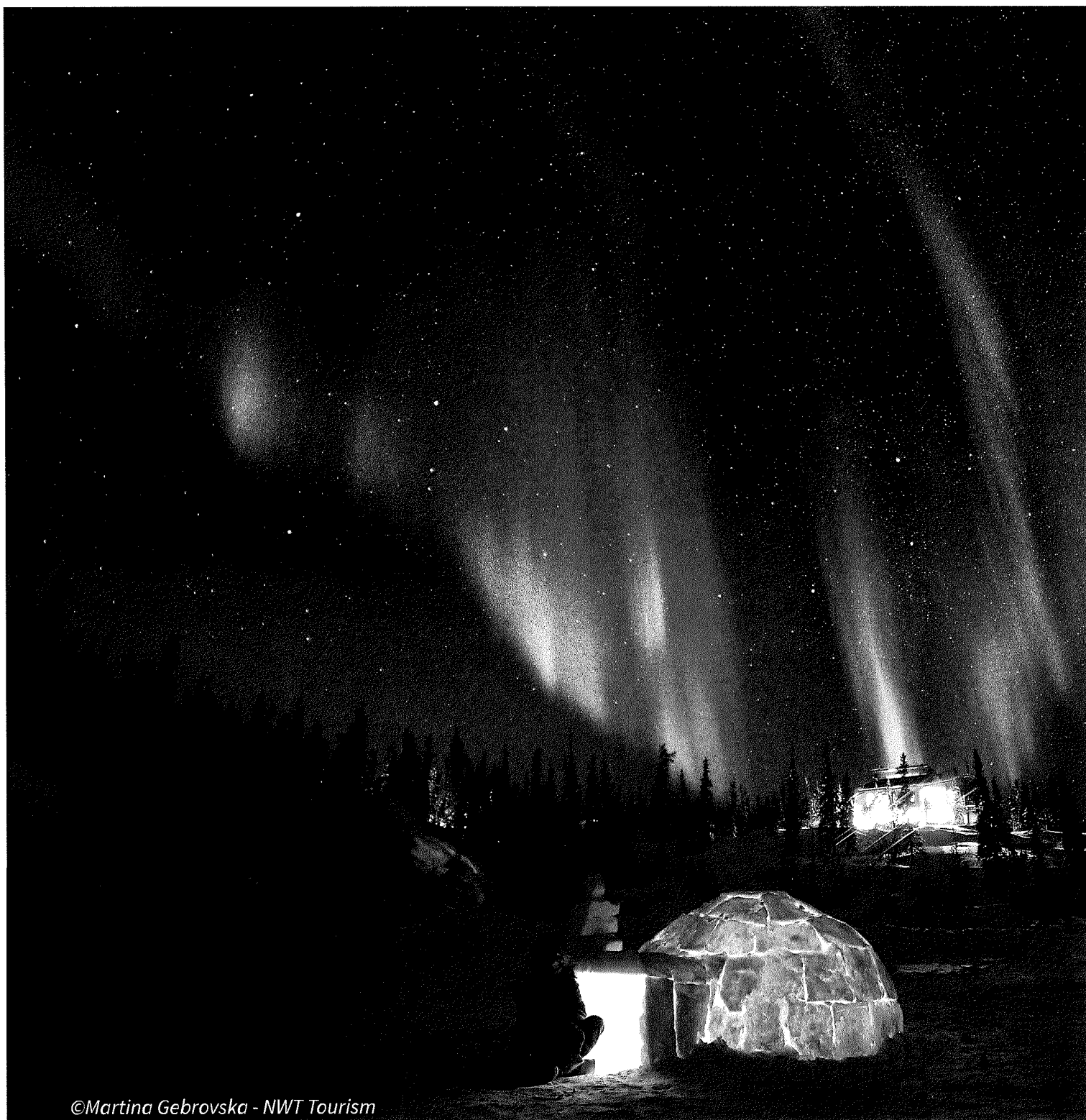
Bill Braden



white



Northland Utilities
An **ATCO** and **NII** Company



©Martina Gebrovská - NWT Tourism

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An igloo beneath the Aurora Borealis, outside
of Yellowknife NT



Participants of the 2018 2-Day Design Retreat
for the Smart Cities Challenge in Yellowknife

EXECUTIVE SUMMARY

Yellowknife is a place where ambition and ideas can easily turn into reality. It is a small, tightly knit, vibrant community with strong leadership and a desire to foster innovation. The Smart Cities Challenge has engaged the City to envision a future where technology is a key part of everyday life and the design and control of that technology is controlled by clear policy for the benefit of all Yellowknifers.

The City of Yellowknife has done considerable community engagement to understand what a Smart City might mean in the northern context and how it will improve the lives of its residents. The focus of this proposal is on five key impacts: extraordinary skies, tourism, a replicable framework for northern innovation, community connectivity and sustainability. To achieve these impacts there are a series of outcomes that will be attained through the diverse technological innovations to be incorporated into the lampposts much like apps to a smartphone.

These technologies will all be vetted through new strategic thinking that will learn from the best of European and North American Smart City experience to help nurture a Northern Smart City ethos. By pitching Yellowknife as a cold weather lab for smart city innovation, the City will develop replicable plans, tools and ideas that can be spread throughout the north. The focus on dark skies and light pollution reduction will set the City apart in the competitive world of aurora tourism, and provide economic development opportunities and benefits for Yellowknifers. Electric vehicles, improved city services, beacon and geofencing technology and a mesh network will be some of the tools that help the City meet its ambitions of a smart outpost in the boreal forest.

This proposal outlines how the City proposes to take a measured and reasonable approach to reach the stated outcomes that will define success. The Smart Cities Challenge will be the springboard that turns the simple lamppost into a beacon for sustainability.





The Aurora Borealis viewing experience

6 / CHAPTER 1 VISION

CHAPTER 1

VISION

Challenge Statement

Yellowknife will experience a rise in our community's social and environmental well-being by transforming the simple lamppost into a beacon for sustainability.

The City of Yellowknife's Smart Cities Challenge Statement is ambitious and summons stakeholders to explore the complexities of evolving into a Northern Smart City. In the past year, our efforts towards engagement and research have cemented the importance of using information and technology to better the lives of Yellowknifers. We are excited about this opportunity to use the Smart Cities Challenge as a springboard to make Yellowknife a place that defines itself differently: a place in which knowledge, information and Smart City technology become central to our identity as a cold-weather urban laboratory surrounded by the beauty and vastness of the boreal forest.

There is considerable work ahead before we achieve this ideal, but the pieces are in place, and we have confidence in our staff, our leadership, and in the passionate and engaged population of the City of Yellowknife.

BUILT ON GOLD, NURTURED BY
GOVERNMENT, LIT BY TOURISM
AND LOOKING TO TECHNOLOGY

Yellowknife, "where the gold is paved with streets", or Samba K'e "the Money Place" in the local Wili-deh language, has a fascinating if relatively recent history as a city. Prominently located on the shores of Great Slave Lake, The Yellowknives Dene First Nation have traditionally occupied the region. The location was a rich fishing and hunting ground for the Dene People. The 1930s gold rush led to the rapid influx of prospectors—complete with vehicles, floatplanes and all the latest and greatest technologies of the time. Yellowknife boomed with the development of two huge gold mines that spread along the shores. In time the city grew and developed a new downtown, became the administrative centre of the Northwest Territories (NWT), and eventually the capital city in 1967.

Growth continued in the 1970s and 80s, following the cycles of boom and bust that accompany the mining sector. The eventual decline and closure of both Con and Giant mines impaired the city's economy, until diamonds came to the rescue and led to a second mining boom in the 1990s. The Government of the Northwest Territories (GNWT) signed a devolution agreement in 2013, setting the stage for government to take a larger role in the economy. Meanwhile, the city core that grew so rapidly in the 1950s and 60s started to show its age, and social problems became more apparent. As the current diamond mines move towards the end of their lifespans, the tourism market, in particular aurora tourism, has emerged as a potential area of economic growth.

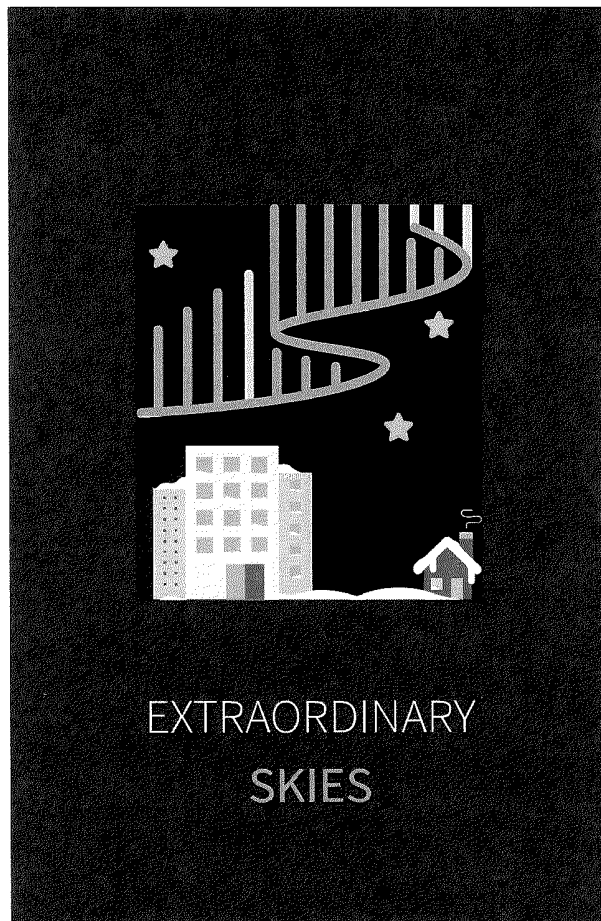
Meanwhile, treaties with indigenous governments in the Territories are being settled, or are in the process—which may bring about more opportunities for revitalization and growth led by indigenous governments. This evolution of opportunities (and challenges) isn't unique to Yellowknife alone, but forces us to look to our changing horizon for the next chance to redefine our city, carved out of the boreal forest on the shores of Great Slave Lake.

IMPACT A: EXTRAORDINARY SKIES

As often happens with shared resources, the night sky viewing experience has been slowly degraded. The pervasive creep of light pollution has been hastened by technology and the energy saving promise of LED lighting. We know that early adopters often learn key lessons about the adverse side effects of technology, but they also benefit longer, and are able to capitalize on future opportunities. As a leader and early adopter of a Smart City mentality, we propose to use our experience to document and outline the challenges and problems we encounter to guide others down the road of advanced technology.

We see the Smart Cities Challenge as our avenue to support other similar-sized cities around Canada, particularly the small towns scattered throughout Canada's North. By implementing a strategic lighting plan alongside interconnected lampposts, and encouraging light reductions city-wide, Yellowknife will lead by example in an area of growing importance. The next step for city lighting is to implement technology that dims and brightens lights at appropriate times. The technology is becoming available to take this city-wide and beyond.

Opening up our skyline to expose the aurora will have multiple benefits for Yellowknifers on top of the economic drivers of tourism. We will become more in tune with the sky and connected with the dancing lights. Decreasing the unnecessary presence of street lighting will allow natural lighting patterns to influence our moods and circadian rhythms without artificial influence. We intend to make the most of this opportunity to not only test the technology, but evaluate and communicate the softer benefits of improved lighting outcomes for human health, community and happiness.

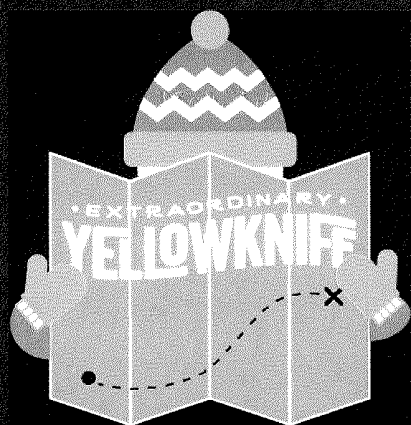


EXTRAORDINARY SKIES

QUOTE

"The Northwest Territories has much to offer travellers – stunning landscapes, rich culture and unforgettable adventure. It also has much to gain. Tourism 2020 is an investment in our people, our communities and our future. This renewable resource has a high return on investment and will create lasting economic opportunities, careers and capacity building throughout the territory."

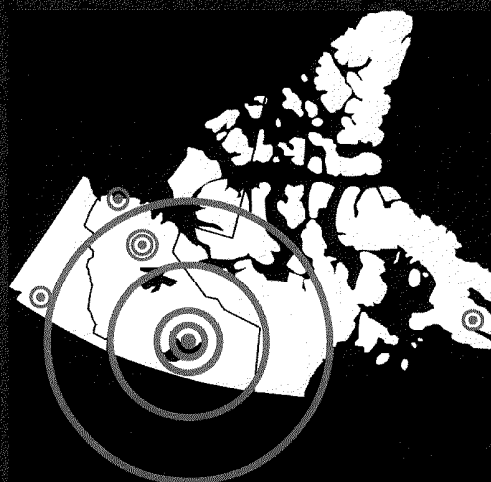
- Wally Schumann,
Minister of Industry,
Tourism and Investment



TOURISM CAPITAL OF THE CANADIAN NORTH

IMPACT B: TOURISM CAPITAL OF THE CANADIAN NORTH

The Smart Cities Challenge will amplify existing efforts to develop our natural tourism resource of "Extraordinary Skies". In 2017-18 over 34,900 tourists travelled to Yellowknife to view the Aurora Borealis or northern lights (GNWT, 2018). Tourism employs over 12% of NWT residents, with a spinoff effect estimated at \$3.80 for every \$1 spent (NWT tourism, 2016). The Government of the Northwest Territories (GNWT) expects 35% growth in the industry increasing visitor spending to \$235 million by 2020 (GNWT, 2016). Yellowknife happens to be ideally situated under the auroral belt, has clear skies and is regarded by many as the best place in the world to view the northern lights.



REPLICABLE FRAMEWORK FOR NORTHERN INNOVATION

IMPACT C: REPLICABLE FRAMEWORK FOR NORTHERN INNOVATION

Yellowknife has the potential to become a place where knowledge and technology combine to carve out a sector of the economy that is defined by our natural and cultivated assets. The city will evolve into an experimental hub of technology and a place of new, innovative enterprise.

The foremost factor encouraging this transformation is the people. Northerners are well known for their resilience, strength of character and resourcefulness, but also for their adaptability and openness to change. Yellowknifers are young and well-educated, having near the highest per capita post-secondary degrees in Canada (McGrath, 2013), and is increasingly multicultural. This unique blend of intellect, diversity, creativity, and youthful vigour, when combined with the knowledge and resilience of our First Nations partners, makes our population a perfect place to build a Smart City.

We view this opportunity as a springboard to build a sustainable model for economic development built on tourism, research, and innovation. Yellowknife's relatively small size makes the City agile. Its location at the end of the highway, in the midst of a cold and harsh climate, makes the city an ideal laboratory for innovation, cold-weather testing and information technology. We see a future pitch from our new smart-city-endorsed label: "tested in Yellowknife".

The final factor is our politics. We are home to a strong base of democratic idealism, a consensus government that isn't subject to partisanship, and a flair for pushing the envelope. A strong civil society is another feather in our cap, and being a small jurisdiction, our partnerships and engagement are based on human relationships—like the comfort that comes from meeting your elected officials in the grocery store checkout line. The key to our continued evolution into a smart city will be engagement with the population, and particularly our First Nations partners and neighbours. We will develop a new story for a diverse and prosperous Yellowknife centered around technology, innovation and resilience.

IMPACT D: COMMUNITY CONNECTIVITY

Our research has shown that having a clear framework for technology adoption and decision-making is key to making a Smart City. Establishing policies, targets, and strategies into a Smart Cities framework will make the ground rules clear, structure our decisions on technology, and evaluate and measure success. In cities like Barcelona, Glasgow and Copenhagen, these frameworks are already well-advanced; these European case studies can serve as models for our own Smart City Vision. White Arkitekter, the largest architecture firm in Scandinavia and a global leader in sustainability, have been a key stakeholder since the beginning to bring European best practices and experience straight to the Canadian North. Carleton University's Urban Research Lab has helped to understand the North American ex-

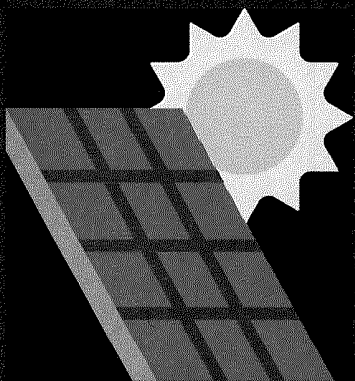


perience with Smart Cities and urban context, while our very own local environmental champion Ecology North has helped the City bring these pieces together in a coherent manner.

Venturing into the realm of Smart Cities is uncharted territory for the stakeholders. We look forward to an iterative process that includes the necessary checkpoints and protocols to ensure that the project moves forward in a meaningful and manageable manner. Already, the Smart Cities process has sown seeds across city departments on how to improve municipal services through integrated technology.

One of the key components of our journey will be to develop an Information Technologies Smart Cities Strategic Plan: which will guide our outlook on Information Technology, and create a framework for making decisions around information moving forward. This framework will be based on the experiences of those who have gone before us, but be scaled and adapted to our unique Northern circumstances.

A key part of our transformation will be continuous engagement with Yellowknife citizens. Open data sharing and knowledge transfer will also help the City gain social licence and trust, build partnerships, and leverage funding and ideas. Using the ubiquitous lamppost as a beacon for sustainability, we will create distinct and unique opportunities for citizen and stakeholder engagement within a Smart Cities construct.



LEADERSHIP IN SUSTAINABILITY

IMPACT E: LEADERSHIP IN SUSTAINABILITY

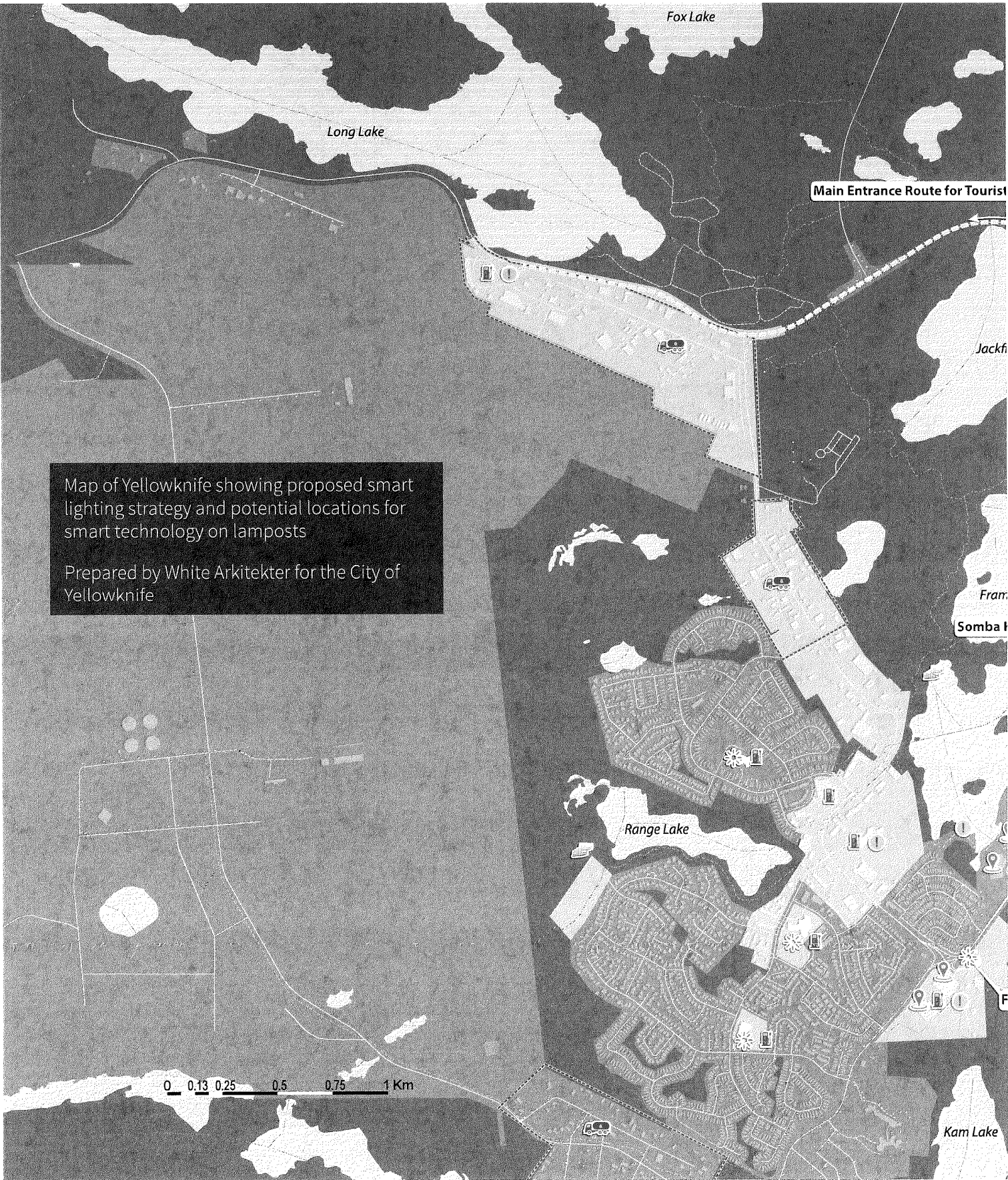
Meanwhile Yellowknifers and tourists will benefit from the adaptation of the lamppost to pose innovative solutions, as suggested by the city's residents. Electric Vehicle (EV) charging stations built right into streetside lampposts will help to encourage adoption of electric vehicles, and prove that they work in the north. Lamppost-based geofencing and beacon technology will help make interpretive materials, event schedules, maps and community knowledge available to tourists, directly through their smart phones and in their mother tongue. Expanded free Wi-Fi would help tourists and locals to connect with services, information, maps and social media. Meanwhile, the majority of city lampposts would be connected to a series of 22 gateways that will move internet protocol (IP) information back to City Hall, and underpin a mesh network and new information hub at City Hall. This network will enable the installation of sensors that can reduce costs for City and other services: such as water and sewer infrastructure, waste, transportation, and data collection on permafrost, climate, and the environment. These improvements in services will help reduce energy and electricity costs and greenhouse gas emissions, improving

our already impressive track record of climate leadership and citizenship to promote buy-in and engagement. To this aim we will cultivate transparency, collaboration, replicability and rapid prototyping in our process of becoming a Smart City.

Yellowknife's northern setting creates unique circumstances around infrastructure, resources, and culture. The implementation of a connected network via the lamppost feature in this remote, climatically-harsh location will pave the way for other northern communities on a regional or national scale. Our frameworks and technologies will be replicable and adaptable to other northern contexts. Yellowknife is well-poised to act as a leader and a laboratory for innovative practices. As we move forward in transforming our City, we look to our citizens to embrace the smart tools and networks that will improve the lives of Yellowknifers. The Smart Cities Challenge is an opportunity to build a sustainable model for economic development based on tourism, technology and the potential for Yellowknife to act as an open-air cold weather lab.



A ribbon of green Northern Lights above mountains



EXTRAORDINARY YELLOWKNIFE STRATEGY MAP



BEACON OF SUSTAINABILITY

At these points of interest the light poles can be given a more striking visual dimension, clearly stating their importance and contribution to Yellowknife's work towards a more sustainable society.



AURORA VIEWING SPOTS

Potential Smart Tech Integrated with Light pole



MUNICIPAL WIRELESS



PANIC BUTTON



GEOFENCING & BEACON AREA



AURORA SELFIE CAMERA



LIGHT SIGNALS

Warns for thin ice along shores or speed limits when in proximity to schools. Close to the fire division they can also signal in case of emergency.



EV-CHARGING STATION



TRUCKED WATER AREA

PRIMARY ROAD

PROTOTYPE AREA

Motion dimmable light

Lighting Priority Zones

LPZ0 - HIGH

Wilderness areas, parks and preserves, and undeveloped rural areas. Includes protected wildlife areas and corridors.

PZ1 - MEDIUM

Wilderness areas, parks and preserves, and undeveloped rural areas. Includes protected wildlife areas and corridors.

LPZ2 - LOW

Light commercial business and industrial districts, high density or mixed used residential districts.

LPZ3 - LOWEST

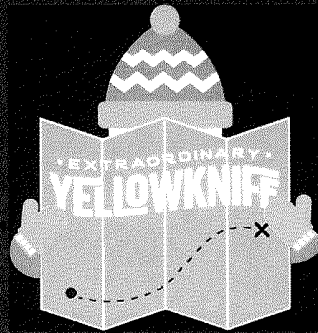
Large cities' business district, commercial corridors, town centers heavy in industrial zones.

CHAPTER 2

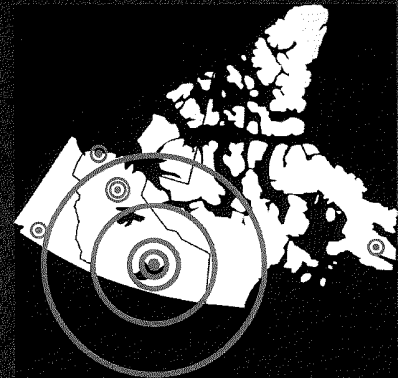
PERFORMANCE MEASUREMENT



EXTRAORDINARY SKIES



TOURISM CAPITAL OF THE CANADIAN NORTH



REPLICABLE FRAMEWORK FOR NORTHERN INNOVATION

OUTCOMES

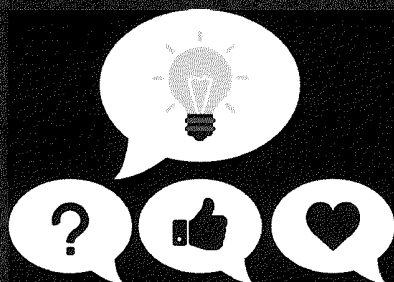
- A.1** Increase in Dark-Sky Friendly Neighbourhood trends
- A.2** Decrease in sky glow (light pollution) based on 2019 levels
- A.3** Increase in public awareness about effects of light pollution

OUTCOMES

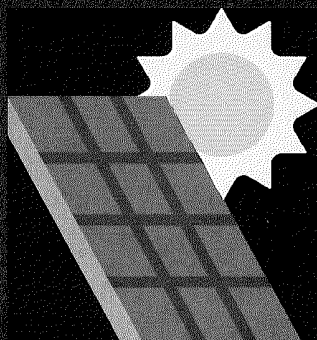
- B.1** Increase in tourism
- B.2** Increase in quality of Aurora Borealis viewing experiences
- B.3** Increase in location-tagging and tourism hashtags
- B.4** Increase in use of Ping Street app
- B.5** Sustainable economic diversification and income to local tourism-based businesses

OUTCOMES

- C.1** Finalized, scalable and shareable IT strategy for northern municipalities
- C.2** Outputs consistent with Smart City Vision at 3 & 5 year Checkpoints
- C.3** Participation by external contractors in developing applications for Yellowknife IoT infrastructure
- C.4** Reduction in cost and increase in reach of municipal services



COMMUNITY CONNECTIVITY



LEADERSHIP IN SUSTAINABILITY

OUTCOMES

- D.1** Increase in local expertise and literacy regarding smart cities technology
- D.2** Increase in engagement on Placespeak
- D.3** Increase in real-time information being updated in the Pingstreet App
- D.4** Increase in broadcasting impact and reach

OUTCOMES

- E.1** Yellowknife will lead the North in Electric Vehicle penetration
- E.2** Make progress toward the targets set in Yellowknife's Corporate and Community Energy Plan
- E.3** Reduction in electricity use from dimmable streetlights
- E.4** Reduction in water and energy use and carbon emissions from improved city services
- E.5** Progress toward achieving United Nations Sustainable Development Goals

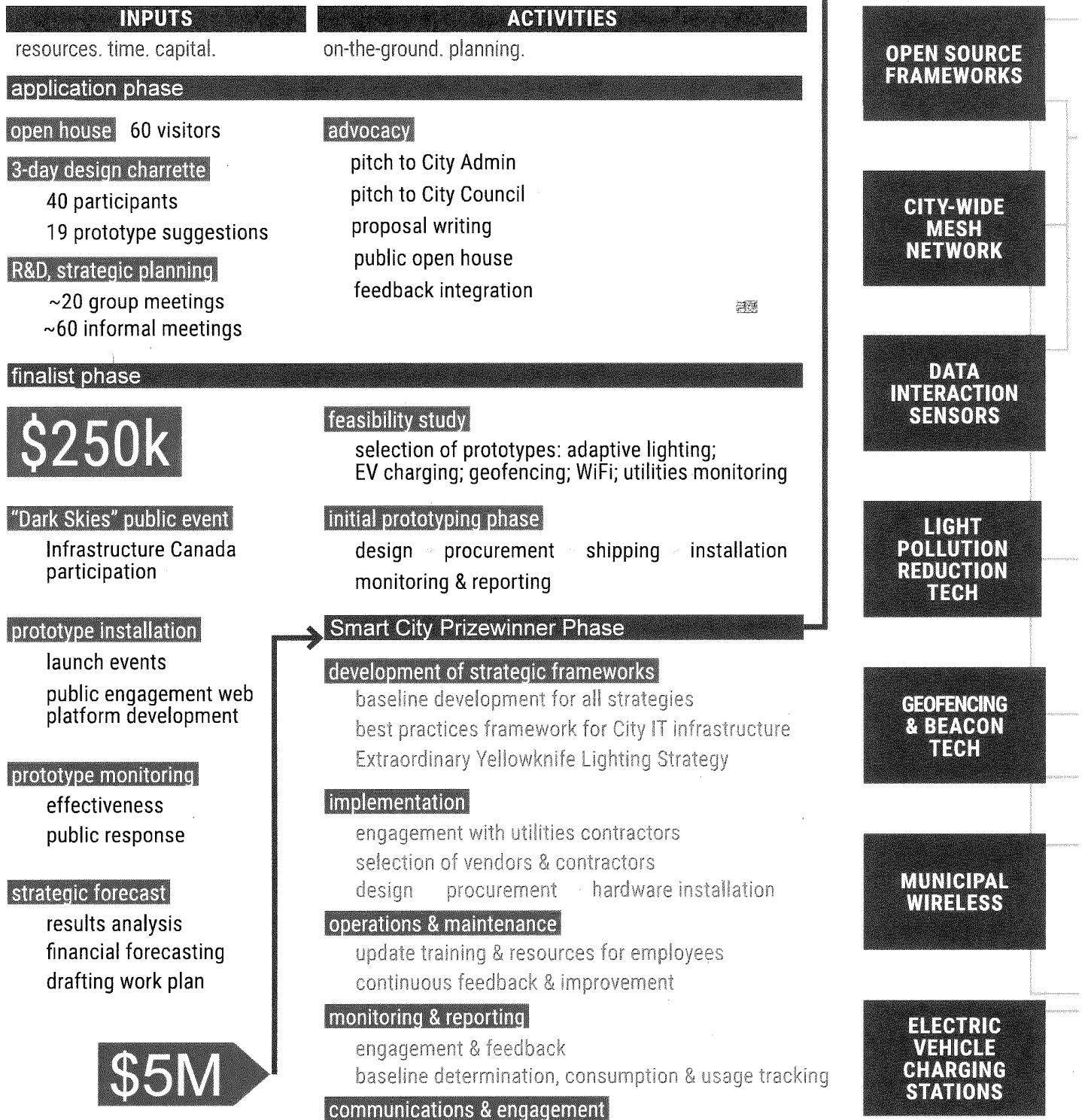


©Adam Pisani - NWT Tourism

Tourists at Aurora World
viewing the Northern Lights

CHAPTER 2

PERFORMANCE MEASUREMENT



higher control

OUTCOMES

qualitative & quantitative. not 100% controlled.

IMPACTS

residents' vision & aspiration.
horizon 2050.

Strategic Smart City Vision aligned with municipal plans

- finalized, scalable and shareable IT strategy for Northern municipalities
- alignment of outputs with Smart City Vision at 3 & 5 year Checkpoints

C.1

Increased monitoring, efficiency & availability of municipal resources

- ↑ diversification of IoT service offerings
- ↓ cost and ↑ reach of municipal services
- ↓ water/energy use and carbon emissions by municipal services

C.2

C.3

E.4

Economic diversification

- ↑ local expertise and literacy regarding Smart City technology
- ↑ tourism
- ↑ income for local service-based businesses

D.1

B.1

B.5

Decreased light pollution in designated neighbourhoods

- ↑ Dark Sky Friendly neighbourhood trends
- ↑ Aurora Borealis viewing experience
- ↓ sky glow down from 2019 standards

A.1

B.2

A.2

Health, safety, and environmental benefits

- ↑ public awareness about light pollution
- ↓ street lighting energy consumption

A.3

E.3

Community connectivity

- ↑ location-tagging and tourism hashtags
- ↑ accessibility of information for residents and tourists
- ↑ traffic on PingStreet app

B.3

D.3

B.4

Reinforced engagement with stakeholders & ongoing resident feedback

- ↑ public engagement on PlaceSpeak
- ↑ broadcasting impact of web-based community consultation

D.2

D.4

Measurable progress towards sustainable development

- ↑ Yellowknife will lead the North in Electric Vehicle Penetration
- ↑ progress towards Corporate & Community Energy Plan targets
- ↑ progress towards achieving UN SDG's

E.1

E.2

E.5

EXTRAORDINARY
SKIES

TOURISM CAPITAL OF THE
CANADIAN NORTH

REPLICABLE
FRAMEWORK
FOR NORTHERN
INNOVATION

COMMUNITY
CONNECTIVITY

LEADERSHIP IN
SUSTAINABILITY

VISION STATEMENT

RISE IN WELLBEING
FOR YELLOWKNIFE
RESIDENTS

→ lower control

CHAPTER 2

PERFORMANCE MEASUREMENT

Measuring success against quantitative and qualitative performance indicators is a key part of Yellowknife's Smart City Plan as highlighted in this proposal. The chart on the previous page summarizes this proposal in five columns that help explain the journey to become a Smart City. The **inputs** tell the story, while **activities** summarize the proposed plan, and the final column, **Impacts**, summarizes the vision. The **outputs** column highlights the deliverables and technologies, while the **outcomes** are the key to performance management. Striving to achieve the impacts and fulfill the vision will be an iterative journey. This journey will recognize a considerable number of actionable variables that must be addressed in order to reach the measurable outcomes.

MEASURING PERFORMANCE

To build consensus, understanding and consistency around a Smart Cities framework, Yellowknife will consider following the International Organization for Standardization Certification ISO 37106:2018 for Sustainable Cities and Communities. This document gives guidance for leaders in cities and communities on how to develop an open, collaborative, citizen-centric and digitally-enabled operating model for their city that puts the vision for a sustainable future into operation (ISO, 2018).

As the basis for a new Smart City Yellowknife vision, the ISO standard will enable processes for the innovative use of technology and data. It will ensure that the City is working within a consistent and globally accepted framework for sustainable cities. Further to this the City will initiate a series of strategies and action plans that will provide a framework to reach the stated impacts. This chapter will highlight the five impact streams that

the City has identified to help reach the vision, the outputs which are the plans to get there, and the outcomes that will allow for performance measurement.

IMPACT STREAM A: EXTRAORDINARY SKIES

Yellowknife will maintain its reputation as the most attractive aurora borealis tourism destination in Canada by focusing on the reduction of light pollution using dark sky principles and a city-wide Lighting Strategy. Putting in place the conditions necessary to achieve Extraordinary Skies starts with a progressive transition to embracing Extraordinary Yellowknife (output A.2). The municipality will slowly phase out lights that are not compliant with the concept of Dark Sky municipalities. Most of the long-term impacts are outside the timeframe of this Smart Cities Challenge, and should be visible over the course of the next 10 years. However, it is anticipated that the implementation of new lighting will have an immediate, noticeable impact on light pollution.

Output A.1 Light pollution baseline in Yellowknife

Output A.2 Development of "Extraordinary Yellowknife" Lighting Strategy to guide municipal retrofit lighting plan

Output A.3 Best practices guide for dark skies compliance

Output A.4 Transitioning of select Yellowknife streetlights to smart lighting technology, in alignment with the Lighting Strategy

Output A.5 Retrofitting of select Yellowknife neighbourhoods into Dark Sky compliant areas

The determination of the current light pollution baseline (output A.1) will show the potential for what is yet to come. Using the latest technology, the Yellowknife Smart Cities Challenge team will measure the current light pollution levels in the City. It has not been decided yet what tool will be used, nor if the light pollution illuminance in the covered or starry sky will be measured. Additional

work is underway to determine the best technique that will not provide erroneous results because of changing weather conditions.

The City will evaluate the effectiveness of the motion sensing dimmable light pilot project on School Draw Avenue with regard to energy savings, functionality, safety, security, light pollution reduction and citizen approval. The City and partners will identify appropriate improvements and a plan to expand to lighting retrofits and city wide lighting improvements strategically (output A.4).

As part of a city-wide expansion of dark sky compliance, the City will continue to work toward reductions of unnecessary lighting and improving awareness about the effects of light pollution. This output will be no additional cost for Yellowknife residents as it does not force an immediate retrofit, but rather a long-term change in mentalities. Local retailers will be moving towards Dark Sky friendly lighting fixtures. There is no requirement, but built in incentives and awareness of benefits to encourage homeowners and businesses to change the existing non-compliant lighting fixtures.

Outcome A.1 Increase in Dark-Sky Friendly Neighbourhood trends

Outcome A.2 Decrease in sky glow (light pollution) based on 2019 levels

Outcome A.3 Increase in public awareness about impacts of light pollution

As the centerpiece of Yellowknife's Smart Cities experience, the City will experience a reduction in light pollution, better aurora viewing outcomes and a closer connection with our extraordinary skies. Learning from the pilot project on School Draw Avenue will assist the City as it expects to expand dimmable lighting throughout half of the city within five years. All of this will be done with guidance from the Yellowknife Lighting Strategy once approved by Council. A strategy will also be set for how to start a public awareness campaign to educate and encourage residents and businesses to reduce private lighting and to encourage dark sky compliant fixtures. Efforts will also be made toward strengthening partnerships

in order to understand and study the impacts of LED lighting on human health and wildlife.

As motion sensing dimmable lighting is a relatively recent technology there are risks for early adoption. The City intends to work closely with industry and partners to ensure lessons are learned from the pilot project, and that residents understand and are excited about the prospects of dimmable lighting. The biggest risk factor is the potential for perceived safety risks to negatively impact the public appetite for dimmable lights. To mitigate this risk the City will research and communicate the safety and health benefits of motion-sensing dimmable lighting to the people of Yellowknife.

IMPACT STREAM B: TOURISM CAPITAL OF THE CANADIAN NORTH

Yellowknife is happy to be a market leader as a northern tourist hotspot. To maintain and improve this status will require considerable effort in many areas, including efforts to use technology to improve the experience of tourists. This will be done by using smart lighting to better showcase our extraordinary skies (output B.1). Improving tourism products and services while catering to a new brand of Smart City tourism that has the potential to create sustainable economic diversification and provide income to local tourism-based businesses.

Output B.1 Promotion of Extraordinary Skies for tourism (in parallel with outputs A.2 to A.5)

Output B.2 Work with partners to increase availability of resources and information to tourists, using both digital and traditional platforms

Output B.3 Expansion of geofencing infrastructure

Output B.4 Development and installation of beacon technology

Output B.5 Expansion of existing free municipal wireless network

Outcome B.1 Increase in tourism

Outcome B.2 Increase in quality of Aurora Borealis viewing experiences

Outcome B.3 Increase in location-tagging and tourism hashtags

Outcome B.4 Increase in use of PingStreet app

Outcome B.5 Sustainable economic diversification and income to local tourism businesses

Taking pride in our Extraordinary skies and improving night sky viewing opportunities for tourists will be a key part of the Smart Cities plan. This will be easily tracked by economic indicators that the Government of NWT compiles around tourism, and also adoption and use of apps, social media and beacon technology. But the full story of how a Smart City focus improves the tourism experience will be found in qualitative experience of the tourists itself. To that end the City will continue to work with partners at NWT tourism, the future Yellowknife destination marketing board, and tourism industry providers.

There are global and national issues that pose a risk to tourism in Yellowknife. These are beyond the control of the City, but by improving the experience of tourist through tourism and a Smart City experience that risk will be substantially mitigated.

IMPACT STREAM C: REPLICABLE FRAMEWORK FOR NORTHERN INNOVATION

Developing a clear strategy for making Yellowknife a smart city, as well as an open transparent cold-weather laboratory for smart cities technology, are both key aspects of this plan. Being the hub for the North, Yellowknife also wants to document and communicate successes and failures to help other similar-sized northern communities adopt smart practices, policies and technology that make sense in our harsh climate. The City intends to do this through the following five outputs, measurable by the subsequent outcomes.

Output C.1 Adoption of ISO 37101:2016 Sustainable Cities and Communities

Output C.2 Commissioning of Smart Cities IT strategy and action plan

Output C.3 Creation of Smart City Committee to oversee the integration of Smart Cities vision into municipal services and infrastructure

Output C.4 Expansion of municipally-owned Internet of Things (IoT) infrastructure

Output C.5 Improvement of City Information Hub, backhaul infrastructure and lamppost mesh network.

Output C.6 Development of Engagement Plan, including incentivization plan and protocol for third party participation

Output C.7 Creation of research budget to incentivize entrepreneurial Smart Cities innovation in a northern setting

Outcome C.1 Finalized, scalable and shareable IT strategy for northern municipalities

Outcome C.2 Technology-related outputs consistent with Smart City Vision at 3 & 5 year Checkpoints

Outcome C.3 Measurable improvement in developing applications for Yellowknife IoT infrastructure

Outcome C.4 Reduction in cost and increase in efficiency of municipal services

Key outcomes will be achieved following the development of strategic plans, and the subsequent improvement of the IT strategy and system. This will help turn Yellowknife into a centre where IT and information generated by smart data become key factors in municipal strategic planning, and smart technology solutions are increasingly adopted by the public, society groups, and the private sector.

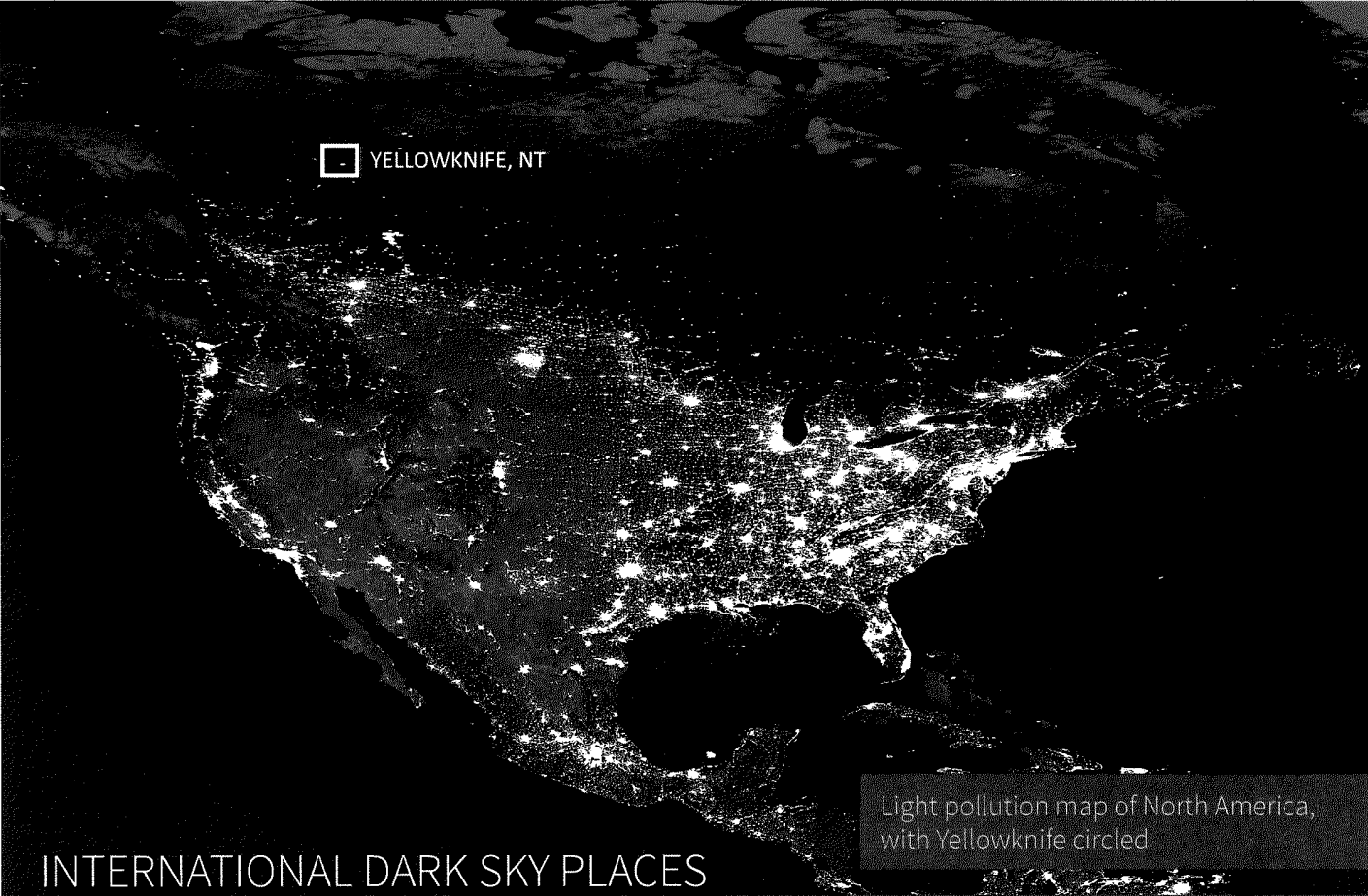
Incorporating project “checkpoints” at the end of years 3 and 5 is a strategy for course correction that mitigates the risk of misaligning outputs with outcomes. Oversight of the three- and five-year checkpoints will fall under the purview of the Smart Cities Committee. This committee will pro-

vide oversight for the assessment and implementation of the IT Strategy in alignment with the Smart City vision and is described in more detail in chapters 3 and 5 of this proposal.

An anticipated risk for Yellowknife is that investors and the private sector will not see the financial benefit of participating in a small market pool. To mitigate this risk, the Incentivization Plan (output C.5) will work with targeted companies and stakeholder groups within the city to design the tools that build the Smart City. A variety of engagement tools will be

used: mini challenges, university engagement, rewards and targeted workshops. This Incentivization Plan will be a key element to promote smart cities and encourage engagement.

The backbone technology for the implementation of a Smart City that is replicable across the north will be unleashing the potential of the internet of things (IoT) in Yellowknife, and collecting, organizing and communicating the information in a form that improves the well-being of Yellowknifers (output C.4). This will enable a plethora



YELLOWKNIFE, NT

Light pollution map of North America, with Yellowknife circled

INTERNATIONAL DARK SKY PLACES

Kerry Dark Sky Reserve, Ireland

The International Dark Sky Places (IDSP) is a program founded in 2001 to preserve and promote dark sites on the international scene. IDSP works together with communities & preserved areas to promote responsible lighting policies and to foster public education.

The Dark Sky Friendly Developments of Distinction is a certification based on sensitive outdoor lighting and on efforts to limit glare and skyglow.

of sensors to be incorporated into the system using the lamppost as a platform. The number of sensors will be a key outcome. We cannot predict which ones will be included and when but some we have identified as promising include: water and sewer tank sensors, leak detection, parking occupancy, snow level, carbon dioxide, distance measurements, trash bin levels, potable water tank level, wastewater tank levels, manhole open/close detection, light sensor, pedestrian, automobile and bike traffic, ice thickness, wildlife activity, water quality, water contaminants, smart valves, and more.

IMPACT STREAM D: COMMUNITY CONNECTIVITY

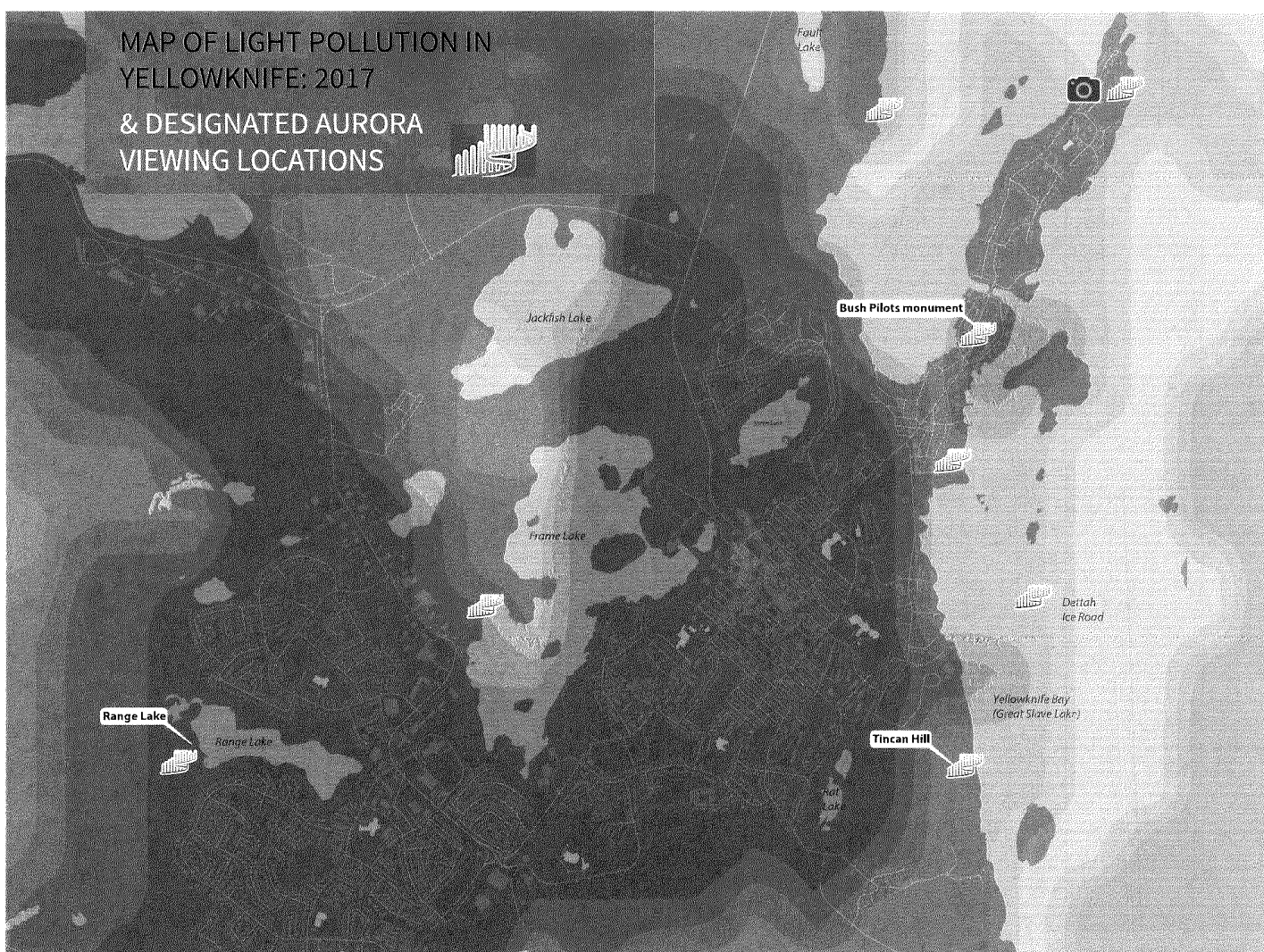
Output D.1 Governance structure in place to oversee the development of a Communications Plan and budget

Output D.2 Annual Engagement Plan to build awareness excitement and engagement in Smart City Evolution

Output D.3 Development of Yellowknife Smart City Dashboard to accompany PingStreet App

Output D.4 Installation of WiFi hotspots throughout the City for free internet services

Output D.5 Implementation of training strategy for municipal employees and contractors to build local labour capacity in smart city technology



The City of Yellowknife has made great strides towards accountability and engagement with residents. In 2015 Yellowknife launched the Pingstreet app; a one-stop mobile application for the City of Yellowknife services. It currently has over 1,300 unique users in Yellowknife and has proven to be an effective tool for fostering an active and informed community. This application is a free, widely available location-based tool that gives users access to information on various city services like parking and transit. In addition, the City has a tool called PlaceSpeak which is a medium for two-way communication between the City of Yellowknife and its residents. This communication and engagement tool was introduced in April 2016 and has since accumulated 1,284 connected participants, 211 comments, and 17 completed surveys across 14 different community consultation projects. The municipal mapping tool City Explorer communicates information spatially in many layers. These tools form the basis for engaging with Yellowknifers digitally and will be incorporated into a strategic plan for Smart City Engagement, which will become part of the Smart City journey.

The Engagement Strategy and Communication Plan (outcome D.1) will help to build awareness and approval among Yellowknife residents about what a Smart City is. It will also assist in addressing any risks or concerns perceived by the public in order to increase local support for a Smarter Yellowknife. Engagement will be increased by a dedicated budget to improve the engagement tools and communication that residents use to access city services, and by maintaining a clear focus on transparency and openness. The Smart City Dashboard and PingStreet app will be the main points of access to municipal services and information and will facilitate residents' interactions with the city.

The City will assess its Engagement Strategy at the end of years three and five of this project's timeline. This will allow the municipality to keep track of its progress, and reorient efforts towards the most critical problems. These assessments serve as built-in checkpoints for course correction and risk mitigation.

Outcome D.1 Increase in local expertise and literacy regarding Smart Cities technology

Outcome D.2 Increase in engagement on PlaceSpeak and City Dashboard

Outcome D.3 Increase in real-time information being updated in City communications

Outcome D.4 Increase in impact, awareness and reach of technology and Smart Cities

Having a connected and engaged population is key to truly embracing the Smart Cities Vision. This is not easy to do with the competing flood of information and media, but cities are becoming more central to the lives of citizens as information and service provision becomes more centralized online. To accomplish the outcome of a more engaged population, the City will develop a strategy and communication plan, improve and coordinate its existing tools, and develop a new tool, as well as engaging stakeholder groups more effectively.

Continually incorporating stakeholder and resident feedback in planning and activities will mitigate risk surrounding public perception and participation. Following the standard set by ISO 37106:2018 and adhering to oversight by stakeholder committees will ensure openness and transparency in communications.

IMPACT STREAM E: LEADERSHIP IN SUSTAINABILITY

With a track record of sustainability, the City of Yellowknife is no stranger to being a northern leader in green innovation. In 2012 the City attained all five corporate and community milestones in the Local Governments for Sustainability and Federation of Canadian Municipalities (FCM) Partners for Climate Protection program. Since then, the City has also been awarded:

- 2011: FCM Sustainable Communities Award for the Smart Growth Development Plan.
- 2013: Green Champion Award and the Sustainable Communities Award for the centralized composting pilot project

- 2018: FCM Sustainable Communities Award for Energy for district biomass energy system (saving 829 tonnes of CO₂e/year)

The continued effort toward sustainability by the City of Yellowknife is demonstrated in the 2015 to 2025 Corporate and Community Energy Action Plan. Building on the 2006 Energy Plan, this new rendition sets a target for a fifty percent reduction in greenhouse gases by the City Corporation and thirty percent reduction by residents and businesses.

Output E.1 The creation of an incentivization plan for electric vehicle penetration in Yellowknife

Output E.2 Continued improvement of partnerships with key stakeholders

Output E.3 Installation of municipal EV charging stations

Output E.4 Promotion of GHG emission reductions through incentivization of Smart Cities technologies

Output E.5 Assessment of and reporting on progress towards achievement of the UN Sustainable Development Goals.

A Smart City framework will help the City take one more step forward to achieving this ambitious plan. The framework includes best practices, better engagement tools, and harnessing the power of information and technology to reduce energy use and greenhouse gases. Possibilities for improvements include lighting retrofits, electric vehicle encouragement, sensors that reduce costs incurred by the city, energy costs and greenhouse gases, and even incorporating new biomass heating technologies. In order to direct this project's strategy around sustainable action, The United Nations Sustainable Development Goals were selected as overarching key performance indicators. These were selected during the 2-day Community Design Charrette retreat, and through a selection process led by residents and stakeholders were narrowed down to goals that were applicable to the Yellowknife context. In short, 4 goals and 9 targets were chosen the most critical for immediate action in Yellowknife.

See Chapter 6 *Multi-stakeholders 2-day Design Retreat* for the detailed story.

Outcome E.1 Yellowknife will lead the North in Electric Vehicle penetration per capita

Outcome E.2 Measurable progress toward the targets set in Yellowknife's Corporate and Community Energy Plan

Outcome E.3 Reduction in electricity use from dimmable streetlights

Outcome E.4 Reduction in water and energy use and carbon emissions from improved city services

Outcome E.5 Progress toward achieving the United Nations Sustainable Development Goals as detailed in the Phase 1 Design Charrette Report

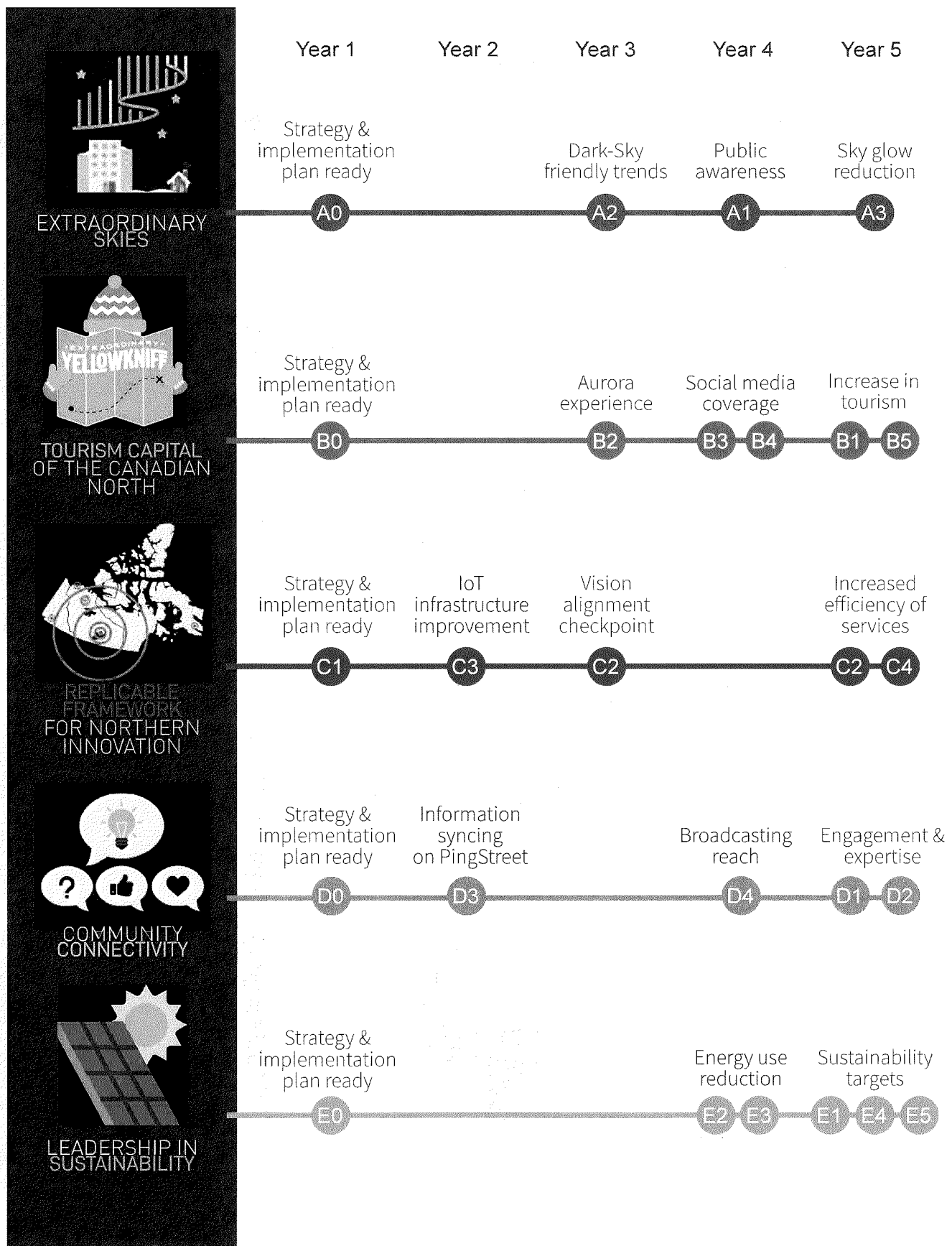
As a true leader in sustainability, the City sees this opportunity as a way to improve its credentials, and use information and the Smart Cities framework as a methodology for more efficient use of internal resources, better services to its citizens, and a reduction in greenhouse gases and energy use.

Being more sustainable is clearly a goal that all cities should aspire to. Above what the City is already doing, the Smart Cities approach should help to harness the power of information and technology to further the impact that the City can make.

PAYMENT TIMELINE

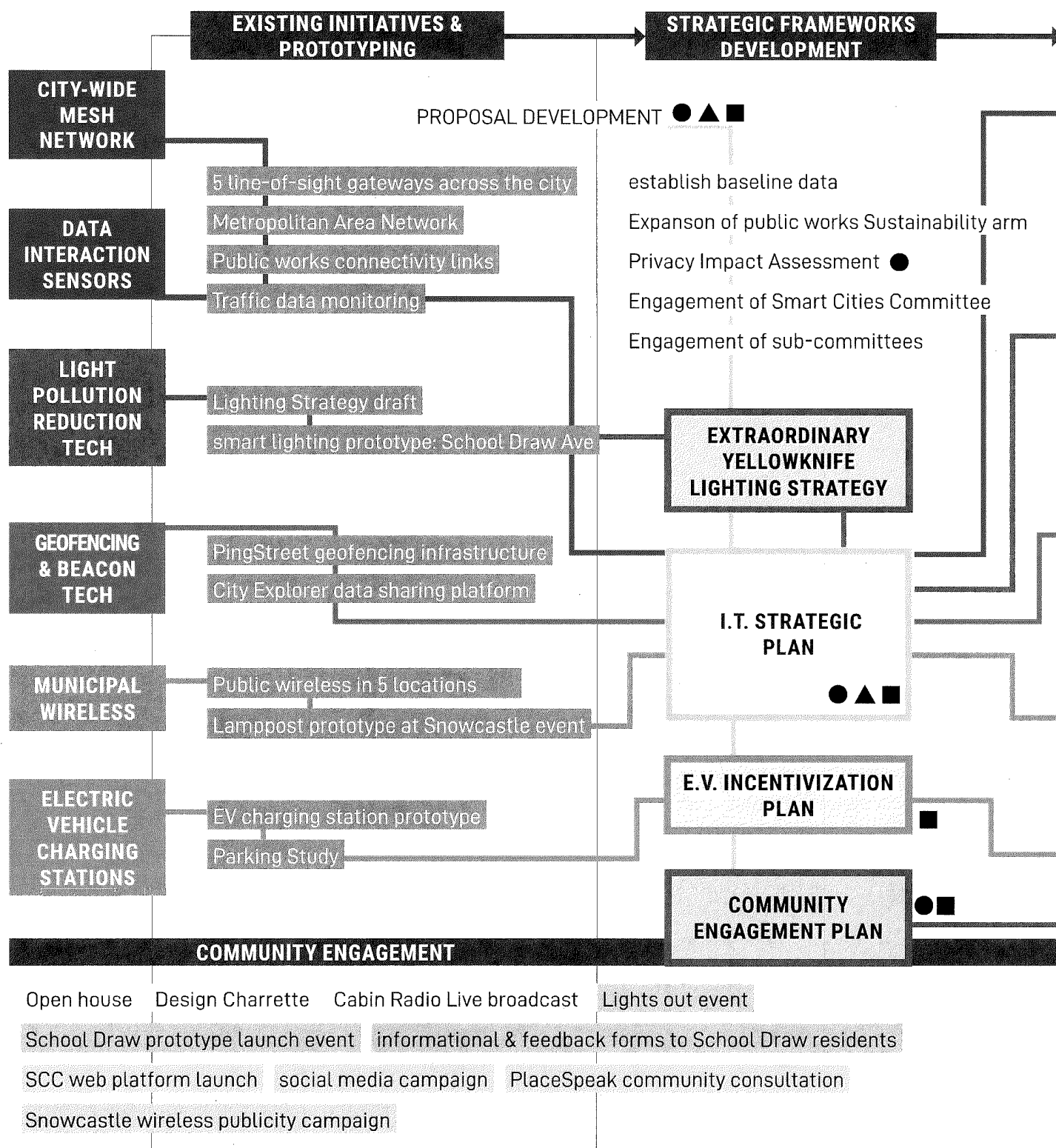
Since the Yellowknife SCC project is predicated on the development of coordinated strategies and implementation plans and a myriad of possibilities, it was a challenge to clearly identify outcomes. The following payment timeline will highlight broadly the anticipated timing of key outcomes which will trigger payment.

PROPOSED OUTCOMES PAYMENT TIMELINE



CHAPTER 3

PROJECT MANAGEMENT



RISK MITIGATION CHECKPOINTS

- privacy & security
- ▲ financial
- stakeholder response

PROCUREMENT & IMPLEMENTATION

Network design

Backhaul development & Gateway installation

engagement with utilities contractors ■

selection of vendors & contractors by RFP process ▲

hardware installation

action plan for implementation

Identify Extraordinary Neighbourhoods ■

RFP process to select vendors & contractors ▲

installation of smart lighting technology

stakeholder engagement re: beacon technology ■

"areas of interest" decision-making & development

contractor selection ▲

app development & testing... ■

assessment of stakeholder needs ●▲

bandwidth expansion

hardware installation

Installation of EVSE based on incentivization strategy

OPERATIONS & MAINTENANCE

update training for municipal employees and contractors

review strategies at three- and five-year checkpoints

continually improve systems based on new technology & stakeholders feedback

MONITORING & REPORTING

contractor engagement & stakeholder response

offerings for IoT services

cost & reach of municipal services

Energy consumption comparison & reporting

Light pollution monitoring with photosensors

Reporting on Dark Sky-friendly trends

engagement with local tourism service businesses

reporting on numbers for Northern lights tourism

Recording feedback re: aurora viewing experience

tracking of app usage & broadcasts reception

reporting on PlaceSpeak engagement

reporting on social media coverage

EV ownership per capita

tracking of energy consumption by streetlights, utilities and services

research & reporting on progress towards sustainability targets

development of new layers on City Explorer for open source sharing of information ●

Extraordinary Skies launch campaign for lighting strategy implementation resident feedback surveys ■

Extraordinary Skies tourism promotion PlaceSpeak civic engagement forum ■

Publicity campaign: EV incentivization strategy incentivization of research & innovation to encourage resident/stakeholder participation ■▲

CHAPTER 3

PROJECT MANAGEMENT

The Project Management Plan aims to align all project outputs with the Strategic Planning initiatives and the City's guiding vision for Smart Cities. The focus is on the sustainable, long-term achievement of successful implementation activities. This necessitates a certain level of fluidity and adaptability, with built-in checkpoints to ensure continual stakeholder support, financial capacity, and data security. The preceding infographic summarizes the sequence of dependencies and scope of activities. Initiatives and outputs are categorized according to the five key impact streams, and will be filtered through a series of strategic frameworks to minimize risk and guide the team's decision-making processes moving forward.

These strategic frameworks will be informed by the ISO 37106:2018 standard and together will serve as the backbone of the Project Manage-

ment Plan. As detailed below, these frameworks include: a Smart City Vision for Yellowknife, an Extraordinary Skies Lighting Strategy, an EV Incentivization Plan and a Community Engagement and Research Plan. Results from monitoring existing initiatives, infrastructure, and prototypes will feed into these project-specific strategies, which in turn will guide implementation activities in alignment with the community vision.

EXISTING INITIATIVES & INFRASTRUCTURE

The City of Yellowknife has several current or planned initiatives that demonstrate transparency, develop our partnerships, and establish a platform for community engagement and feedback. These initiatives include: an electric vehicle charging station prototype, a trial smart lighting

CASE STUDY: DARK SKY COMMUNITY



NACKA, SWEDEN

The lighting strategy used in Nacka considers the identity, the spatial, social, biological and the technical features of a site. In the North, a unique phenomenon to highlight is that the sun takes a longer time to rise and fall giving origin to an extended warm light and a long "blue hour" at dusk and dawn. In this sense, the lighting strategy plays an important role in re-describing the city's structure, scale and target point at night, facilitating us the ability to recognize the space and navigate through it. Light needs to be linked to time to change with the use of urban space throughout the day and the year, supporting human needs and encouraging meeting at nighttime. Considering biological conditions ensure the reduction of impacts of the light on human health, well-being and the natural habitats of animals and plants. This method helps to classify the urban space and their qualities to focus the light on humankind and their activities.

project along School Draw scheduled for March 2019, the continued development of a city-wide data transmission network, Pingstreet app, Placespeak forum, City Explorer online platform, geofencing applications, and free WiFi in city facilities. The city's current data transmission network has collectors in multiple locations throughout the city which can forward information to City Hall and play a role in a future mesh network. The Smart City initiatives already underway in Yellowknife demonstrate the city's existing capacity to achieve this project's outcomes.

"The City is already relatively smart and doing many of the right things. We just need to build strong frameworks and continue to innovate."

*- Harshen Manickum,
IT Department, City of Yellowknife*

RISK MITIGATION THROUGH STAKEHOLDER ENGAGEMENT

To help guide this project, City administration will rely on the guidance of Council. This guidance can be provided in assortment of ways (the assembling of a committee, public engagement open-houses, ensuring that expectations and deliverables of the Smart City project dovetail well with the priorities and ongoing responsibilities of the City. Members of standing committees and directors of departments will influence the implementation of action items and fine tune the necessary metrics to evaluate success and mitigate risk.

The City recognizes that the implementation of this project will have ripple effects on an array of stakeholders. The gained experience of facilitating Smart Cities charette and public awareness sessions has created inroads with key stakeholders in tourism and economic development. It is anticipated that the City lean on the expertise within its networks to ensure that the expectations are clear and that outcomes continue to align with Challenge Statement.

STRATEGIC FRAMEWORK FOR IMPLEMENTING THE SMART CITIES VISION

The Smart Cities Vision will establish a holistic approach to managing both the new opportunities and the new risks posed by the versatile capacity of smart infrastructure. An external consultant will be determined by an open and transparent RFP process. This consultant will work alongside the City and its partners to build a replicable framework for northern innovation. In the context of this proposal, this strategic framework will be called the Information Technology Strategic Plan, or IT Strategic Plan.

This IT Strategic Plan will be a solid foundation of agreed-upon guidelines to mitigate risk in terms of security and adapt to changing technology. The Plan will establish rules for the treatment of personal information, integration of new technology with existing infrastructure, requirements for IT security, access control, auditing, and the retention and disposition of corporate electronic data. While flexible enough to adapt to changes from council or administration, the IT strategy will feed into the City's overall vision and have the potential to be adapted for use in other Northern communities.

Areas of focus for this strategic plan include: technology standards, privacy standards, an internal business improvement process, education and certification around new technology, and a guide for city departments on implementing and getting the most value from new technology. An allowance has been made in the budget for hiring an external contractor to develop this strategy in tandem with the City (discussed in more detail in the Financial chapter). At the three- and five-year mark, a major course correction checkpoint assessed by the Smart City Committee will confirm the alignment of the project's trajectory with the original vision.

STRATEGIC FRAMEWORK FOR SMART LIGHTING

Building on the shared knowledge of White Arkitekter, the proposed Yellowknife Smart Lighting Implementation Strategy will take a comprehensive look at lighting in Yellowknife and suggest a strategic path to reduce light pollution, increase health outcomes, take advantage of our natural assets and adhere to the Model Lighting Ordinance (MLO). The MLO is the result of extensive efforts by the International Dark Sky Association (IDA) and the Illuminating Engineering Society of North America (IES). Among its features is the use of lighting zones (LZ0-4) which allow each governing body to vary the stringency of lighting restrictions according to the sensitivity of the area as well as accommodating community intent. In this way, communities can fine-tune the impact of the MLO without having to customize the MLO. The MLO also incorporates the Backlight-Uplight Glare (BUG) rating system for light sources, which provides more effective control of unwanted light. The BUG system is discussed in more detail in the technology chapter of this proposal.

Adoption of this ordinance will follow the established development, review, and approval processes of the City of Yellowknife and be informed by the Smart Cities Committee. The MLO is probably best adopted as an "overlay zoning" ordinance. This means that it overlays, but is different from, land-use zoning. It can be added to or integrated into existing ordinances or codes and cross-referenced to other applicable codes and ordinances such as the electrical code, the sign code, planning ordinances, etc. Ongoing renewal cycles will be included when adopting the ordinance.

The main tenet of the lighting strategy described in the MLO is the division of land into 5 lighting zones, LZ0 to LZ4. These are (1) no ambient lighting, which is for use in areas with little to no human activity (2) low ambient lighting, which is for use in rural and low density areas (3) moderate ambient lighting, which is for use in commer-

cial business districts and high density or mixed use residential districts (4) Moderately high ambient lighting, which is for use in commercial corridors, high intensity suburban commercial areas, and town centers, and finally (5) high ambient lighting which is not a default zone and should only be used in special circumstances. The zoning considerations and recommended use areas for each of the five lighting zones provide the City of Yellowknife with a formula for re-assessing its current lighting strategy in order to develop a clear plan of where lighting zone ratings need to be upgraded or downgraded. Further conversations with the City's Department of Planning will need to occur to see how best to integrate these zoning suggestions. The outcome of this strategic lighting plan aligns with this projects outcomes of decreasing light pollution, improving the aurora borealis viewing experience, expanding smart lighting, and developing standards that can be replicated in other communities across the North.

STRATEGIC FRAMEWORK FOR ELECTRIC VEHICLE INCENTIVIZATION

Similarly to the IT Strategic Plan, the EV Incentivization and Penetration Framework will be developed in accordance with overarching city goals and in collaboration with an independent contractor. The City will use this plan to implement tools for EV incentives, while working with stakeholders like Northlands Utilities to build consensus and readiness for widespread EV adoption.

Following along the appropriate routes of assessment and approval, the development and implementation of this strategy would align with the 2015-2025 Community Energy Plan. The installation of EV infrastructure and subsequent increase in EV penetration would contribute to GHG emissions reductions for the City of Yellowknife which is relevant to the goals established in the 2015-2025 Community Energy Plan.

STRATEGIC FRAMEWORK FOR COMMUNITY ENGAGEMENT

The Engagement Strategy for implementing the Smart Cities Vision is discussed in detail in the Engagement chapter and outlined in brief here. Past engagement with residents and stakeholders has set the precedent for a project that is firmly grounded in feedback and collaboration. The City is committed to the principles of openness and transparency, and will follow the recommendations of the Community Engagement Plan to build community awareness of Smart Cities. Administration along with relevant stakeholders help guide the implementation of the action plan and address budgetary considerations at agreed-upon checkpoints.

PROCUREMENT

The City's general procurement policy will be used as a template to develop a policy specific to the IT department and the Smart Cities project. The current standard policy specifies that procurement from a sole source is allowable up to \$20,000. If the amount spent is between \$20,000 and \$50,000 a minimum of two quotes or a request for quotes (RFQ) is required. For procurement operations estimated at over \$50,000, a request for proposal process (RFP) or a request for tender process (RFT) is required. The City also

has several Standing Offer Agreements (SOAs) with companies for services that they use on a regular basis such as fuel delivery, minor repairs and maintenance.

Each of the technologies outlined in this proposal faces different challenges in terms of procurement, vendor choice, installation, and maintenance. The decisions made must reflect Yellowknife's particular Northern context: its remoteness, small population, and relatively high density and traffic. A procurement plan based on the IT Strategic Plan will address concerns regarding open data, security, ownership, and feasibility. Cities that purchase from vendors rather than developing the technology can devote more resources to policy & service design. The trade-off is loss of autonomy over the end product. Alternatively, projects that prioritize open data and software interoperability tend to adopt a design-build approach and rely on government support for funding. Due to Yellowknife's size and resources, the most feasible option is to partner with vendors and contractors. Due to the interoperability risks associated with a large pool of vendors, financial feasibility and availability of technical support are increased by limiting the pool of vendors. Based on data security concerns it follows that due consideration be given to the ownership of the end product, and must be evaluated when developing a procurement strategy.

CASE STUDY: EV CHARGING STATION STRATEGY

WHITE ARKITEKER

In implementing Electric Vehicle Chargers we can consider the following stakeholders, their concerns, and corresponding result indicators:

1. Municipality: Achieve sustainability goals while remaining cost-effective. Result Indicators: (a) Air quality improvements, (b) Climate change improvements, (c) cost-effectiveness
2. EV Users: Increased mobility (range & time of driving). Resulting Indicators: (a) Accessibility to chargers, (b) Growth in users
3. Residents (non-EV users): Optimize locations while managing parking pressures. Resulting Indicators: Increased utilization of chargers
4. Commercial Partners: Produce positive business case. Result Indicators: cost reduction
5. Grid Operators Concern: Safeguard Grid Quality Result Indicators: (a) risks of power outage / grid-congestion reduced

City administration will work within the framework of existing policies and best practices to ensure fair procurement procedures. Considerations will be made on how to ensure that procurement protocol is in line with the unique realities of Smart Cities technology implementation. The intent is to keep control of the data while working closely with private partners throughout the process.

OPERATIONS & MAINTENANCE (O&M)

Within the 5-year scope of this challenge and beyond, effective O&M will necessitate new training for skilled employees at the City. For certain project activities, a vendor may also be chosen as the responsible party for ongoing O&M or training. Investment in local capacity will be vital to long-term support and future-proofing of the infrastructure. Simultaneously the project will generate jobs and cultivate a local labour market capable of working with innovative technology. Work will be done to understand labour demand surrounding Smart City technology in the context of regional challenges and needs.

CONTINGENCIES, COURSE CORRECTIONS & CONTROLS

Decisions made during the implementation phase are dependent on strategic plans to be developed in line with ISO 37106:2018 and with input from external contractors, partners, City Council, and City Administration. As detailed in the Performance Measurement chapter (Impact Stream A), project outputs will be evaluated at the three- and five-year mark to confirm that strategic plans and corresponding action plans are being adhered to; these checkpoints constitute built-in opportunities for course correction.

The Smart Cities Committee will ensure the adherence of outputs to agreed-upon standards at the three- and five-year checkpoints. Further opportunities for course correction are built into the sequencing of activities, as indicated in the Project Management flowchart. These control checkpoints have been divided into three categories, which respectively intend to:

- Assess budgetary constraints and develop a plan to mitigate risk (Financial Checkpoint).
- Ensure continued compliance with security protocol and protection of personal data (Privacy & Security Checkpoint).
- Gather and respond to feedback from all affected parties (Stakeholder Response Checkpoint).

Forums such as the PlaceSpeak app and City Explorer platform are in place to maximize the transparency of operations, open-source sharing of data, and opportunity for resident input. Partnership with the Yellowknives Dene First Nation heightens the project's adaptability, diversity of perspective, and range of impact. Expanding Yellowknife's Smart City infrastructure into the neighbouring community of N'Dilo will test the replicability of this technology in the North, and expand the beneficial impacts of the project. The involvement of consultants, academia and utilities provides access to research, experience, and capacity, and serves as a solid foundation for the innovative strategies which will achieve our challenge statement.



Statue of a musk ox outside of
Yellowknife's City Hall in the winter

©Samantha Adrianne

CHAPTER 4

TECHNOLOGY

Transforming the ubiquitous lamppost into a beacon for sustainability is the backbone of Yellowknife's planned approach to become a Smart City. The implementation of this smart technology will be guided by the IT Implementation Strategy, which will set the ground rules for technology deployment, and improved policy. This chapter highlights technologies that have been identified in the proposal writing and research stage as promising options to help Yellowknife achieve its challenge statement. In alignment with the governance structure outlined in Chapter 5, the technologies and technology approaches outlined below will need to be approved and reviewed by City of Yellowknife leadership with input from the Smart City Committee.

The backbone of the Smart City vision for Yellowknife is the installation of smart street lighting infrastructure throughout the city. Lighting retrofits must fit within the principles identified by the lighting strategy outlined in the project management chapter and follow an ordered and logical process. The Implementation Strategy will also reflect engagement with the citizens of Yellowknife and their experience with and feedback on the School Draw Avenue lighting prototype. The

Lighting Strategy will be developed according to these principles.

Switching to smart lighting has the potential to positively affect people, wildlife, the economy and the natural environment. Orchestrating this switch in the context of Yellowknife will also identify new standards and best practices that are replicable in other northern communities. The strategic thinking around the use of light has been guided by the experience of European leaders such as Copenhagen, and the Swedish experience and knowledge of White Arkitekter. The City will also take advantage of the experience and guidance of the International Dark Sky Association to inform Yellowknife's Lighting Plan moving forward. Project partner and current owner of Yellowknife's lamppost, Northlands Utilities, will bring their experience to the project as a leader in motion sensor lighting technology in North America.

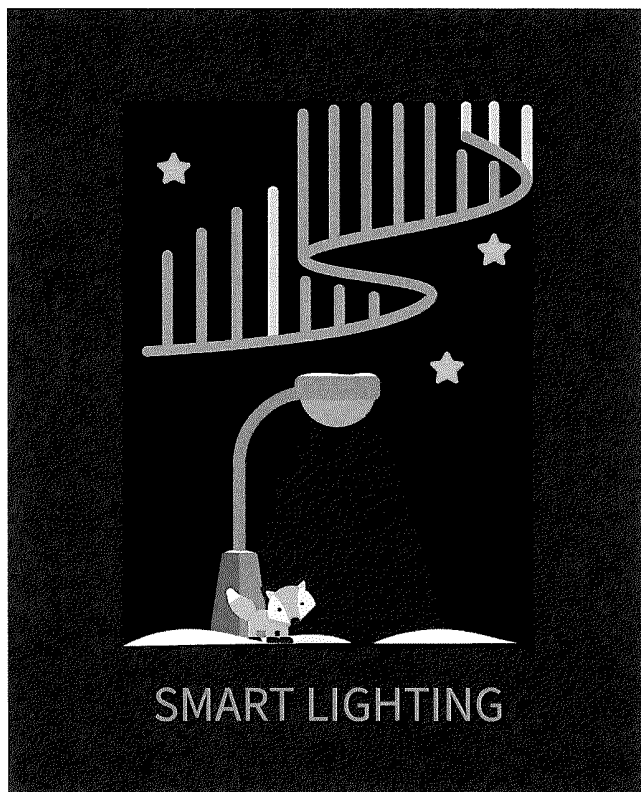
The City will investigate and adopt new Northern-specific lighting best practices that guide light quality, pollution, intensity, and location of light, all with consideration towards Dark Sky principles. Additionally, integrating the combined experience and expertise of our project partners into our lighting strategy is a key step to ensure feasibility and scalability of our proposed technology projects. More on the structure of this smart lighting framework can be found in the project management chapter of this proposal.

CASE STUDY DARK SKY COMMUNITY



MON & NYORD PARK, DENMARK

The Mon and Nyord Park in Denmark is an example of a successful implementation of dark sky compliant lighting in a community setting. The project's mission was to equip the community with tools and knowledge around smart lighting technology. A concert in the park was organized to announce the Dark Sky initiative to the community and get the interest of the local population. Since the park's International Dark-Sky Association (IDA) certification, it has gotten more and more popular locally and nationally. Over 300,000 visitors came to the park in one year.



SMART LIGHTING

The switch from traditional non-responsive lighting to “smart” adaptive lighting is a technological leap that Yellowknife is prototyping on School Draw Avenue. This prototype will include approximately 10 smart lighting fixtures. Smart lighting in the Yellowknife context means streetlights that are connected to motion sensors which direct the gradual dimming and brightening of the lights in response to motion on the street. The light will be dimmed to a much lower illumination and energy use when the motion sensors are not activated. When a pedestrian, cyclist, or vehicle is detected it will increase to 100% brightness, equivalent to that of a traditional streetlight. The motion sensors that detect movement will initiate a communication pathway from one lamppost to the next that will trigger the subsequent lampposts to illuminate, expanding your field of vision in the direction you are travelling. As you move past a lamppost, the motion sensor will indicate to the lamp to begin dimming back down to the baseline level of illumination.

This vision for smart light is modeled off of the Dark Sky approach laid out by the International Dark Sky Association as well as the ATCO-led award-winning Intelligent Street Lighting Project

in Lloydminster, Alberta. The precedent set by Lloydminster for up to 80% energy savings can inform the possibilities for future energy savings from a similar project in Yellowknife (Lopushinsky, 2018). By collaborating with ATCO subsidiary Northland Utilities, Yellowknife is testing the potential for energy, health and safety improvements, while engaging Yellowknife citizens, nearby homeowners and tourists and understanding the public perception, appreciation and challenges of smart lighting. This will help lay the foundation for a lighting strategy that has the potential to be replicated in other locations across the NWT and beyond.

DARK SKY APPROACH

While the focus of the Lighting Strategy is the smart technology, Yellowknife and Northlands Utilities will continue to be guided by the principles established by the International Dark Sky Association. A Dark Sky Community is defined as a community that shows exceptional dedication to the preservation of the night sky through the implementation and enforcement of a quality outdoor lighting ordinance, dark sky education, citizen support of dark skies and new guidelines for night lighting. A municipal lighting ordinance (MLO) zone plan should be created as a base to define the Dark Sky guidelines for lighting. This is discussed in more detail in the project management chapter of this proposal. Our Scandinavian knowledge exchange partners, White Arkitekter, have provided us with a useful and relevant perspective on lighting technology strategy that incorporates: uplight, glare and light trespass maximum acceptable values, lighting design for urban areas that can activate the city at night, and, crucially, lighting technology that can have the right type of light at the right place in the right moment. Additional examples of lighting strategies for winter cities include lighting policies that control light trespass, façade lighting post curfew hours, lighting that can adapt to the reflectance of ground surfaces and that can dim to a minimum when people are not around. This Scandinavian perspective will be integrated into the Yellowknife approach.

LAMPPOST LIGHTING TECHNOLOGY SPECIFICS

LED lights have provided significant electricity and greenhouse gas savings over traditional high pressure sodium lights. Yellowknife has completed a full retrofit of their streetlights, but research from our technology partners, and a case study from Denmark, established that LED bulbs with a brightness of 3000 Kelvin or less have been shown to be the least disruptive to animal behavior and human circadian rhythms. The soft white lights from these bulbs is dimmable and even color-adjustable (White, 2019). The color of natural light varies according to the season and time of day and the ability of artificial light to align with these changes impacts both people and the environment. As part of this project Yellowknife will develop and communicate best practice for northern street lighting design.

MOTION SENSORS

The smart lampposts our technology partner ATCO piloted in Lloydminster used smart photo-cell sensors as motion detectors. This technology is relatively affordable and widely available and, having been tested in a similar climate to that of Yellowknife, appears to be the top choice for motion sensing technology.

ADAPTIVE LIGHTING

Temperatures below zero keep the streets covered by snow during a long part of the year. White and reflective surfaces need less light to be visible than darker and rougher surfaces, such as asphalt or gravel. In line with the seasonal changes, the City's light levels should be adjusted not only based on hours of darkness but also on the presence or absence of snow on the streets and thus the perceived brightness of the surroundings. Smart lighting in this case, can also include adaptive lighting that changes in intensity and even spectral composition depending on the season and time of the day. Having a sensor that measures luminance to trigger different light level settings is today not a standard solution, but is under development by a few known manufacturers in the Nordic countries. Extreme low temperatures

can also present a challenge to the technology if sensors and fixtures are covered by snow and ice limiting their function. Mitigation of this risk could involve incentivizing research through the commissioning of a design charrette or an RFP process.

DEVELOPMENT STANDARDS

The Backlight-Uplight-Glare (BUG) rating system provides more effective guidance for unwanted light. The B rating takes into account the amount of light in the direction of the light source opposite from the area intended to be lighted, also known as light trespass. The U rating defines the amount of light into the upper hemisphere with greater concern for the light near the horizontal angles, also known as light pollution. Glare can range from annoying to visually disabling and the G rating takes into account the amount of front-light. BUG rating limits are defined for each light source and are based on the internal and external design of the light source. The BUG rating limits also take into consideration the distance the light source is installed from the property line in multiples of the mounting height. All three elements of the BUG rating system are taken into account when developing a city-wide lighting strategy, and assist in the creation of lighting zones (detailed in the Project Management chapter).

RISKS

It is important to acknowledge that dimmable lighting will be a noticeable change for the public. Maintaining public engagement, monitoring feedback, and addressing concerns is a critical aspect of implementing this technology and will be addressed in more detail in the engagement section of this proposal. We fully anticipate concerns over safety and security, which will need to be addressed up front and in a positive and constructive manner to win Yellowknifers' trust and build confidence in Smart lighting technology. Targeted awareness campaigns in the prototype area can help respond to resident questions. Feedback and opinions will be documented and a reassessment will occur later in the process to evaluate any change in perspective.

COST

One of the main challenges with lighting retrofits is the high cost and sheer numbers of lights in Yellowknife. The Lighting Strategy and pilot project will identify costs, concerns and lay out a scalable model to spread the technology throughout the City. Following the successful demonstration on School Draw, we believe the energy savings will provide valuable cost-benefit data to influence the completion of the lighting retrofits in Yellowknife and more remote diesel fueled communities throughout northern Canada.

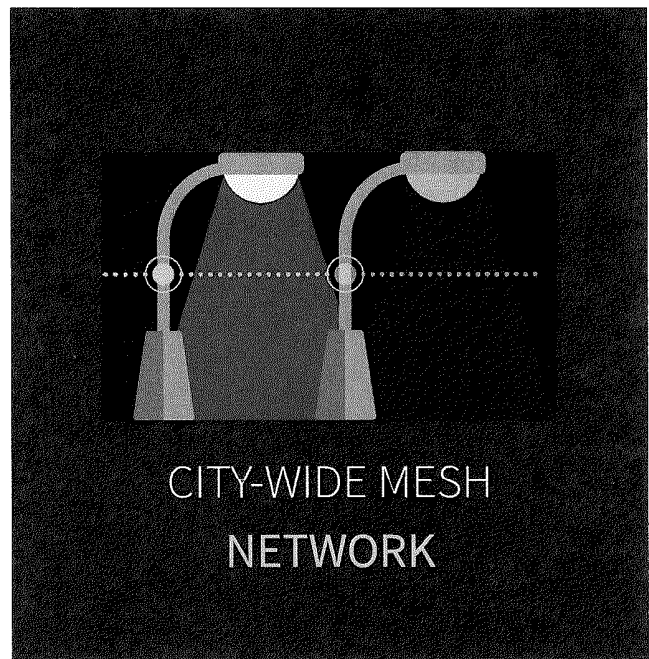
FUTURE-PROOFING

Another challenge is the future-proofing of the system. Technological advances in lighting are happening quickly and being a trailblazer includes risks of obsolescence and being eclipsed by new technology. The Smart City Committee will address this within strategies of IT and lighting to implement open and non-proprietary technology and regularly review and make adjustments for technological innovation and flexibility. This involves implementing a lighting system that allows some flexibility for updates in the near future. This is built on systems where LED modules are easy to replace, where sensors use standard-global connectors, and where the overall technical equipment is interoperable rather than customized.

QUOTE

"The City of Yellowknife has prime locations in the city to act as collectors where multiple neighborhoods could uplink to. This means that in each neighborhood, a cabinet or building with equipment can be placed to be a connection point for the lampposts in that area. This equipment can then forward the data to our collector sites and then to City Hall or beyond (Internet). This equipment routes Internet Protocol data(IP) but not other protocols such as Blu-tooth or Zig Bee that are used by many sensors manufactured today. These sensors will need technology to communicate with that can translate to the IP network and beyond"

- Chris Goit, Network administrator
City of Yellowknife IT Division



MESH NETWORK

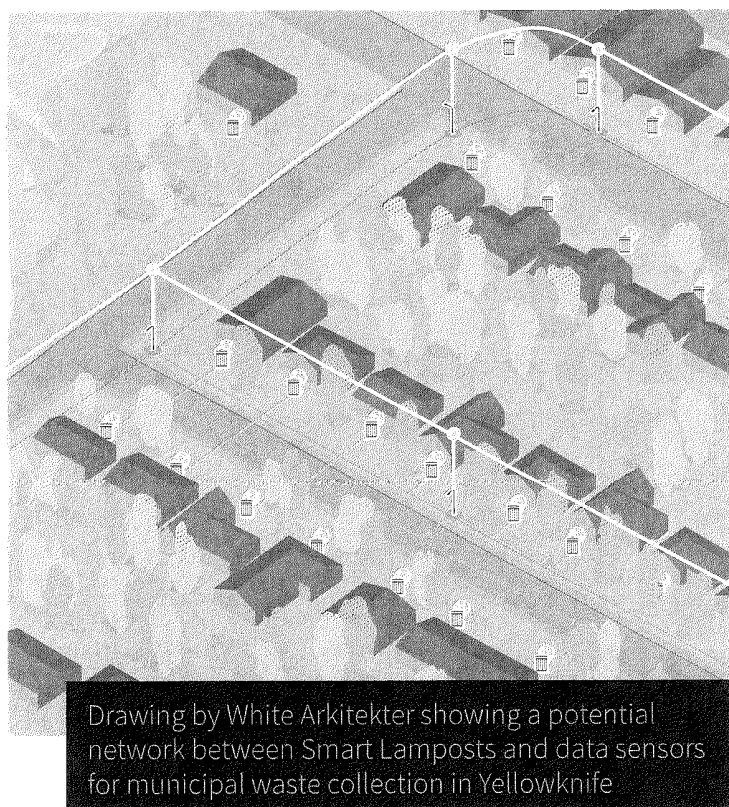
Yellowknife, like most cities, is connected by a spider web of lampposts on almost every street, park, parking lot or corner of the city. In a typical city each one acts alone, powered by an electricity feed, and turned on or off by a photocell, in every sense they are a relatively simple technology which does not often live up to its almost limitless potential. Imagine a city where these lampposts were connected to each other, and to a central information hub via a set of gateways. The potential is ripe for City managers, utilities, contractors, and entrepreneurs to connect sensors into the network to collect information, control a myriad of products and provide residents with more efficient and better services and knowledge.

This mesh network is not just a dream but it is possible, and the City will investigate how to put in place a plan to test a network that could revolutionize how information is provided by the City and other services. This is an ambitious task and requires continual improvement to the City's current system of gateways, as well as supportive policies for information collection and management, and an optimized control centre.

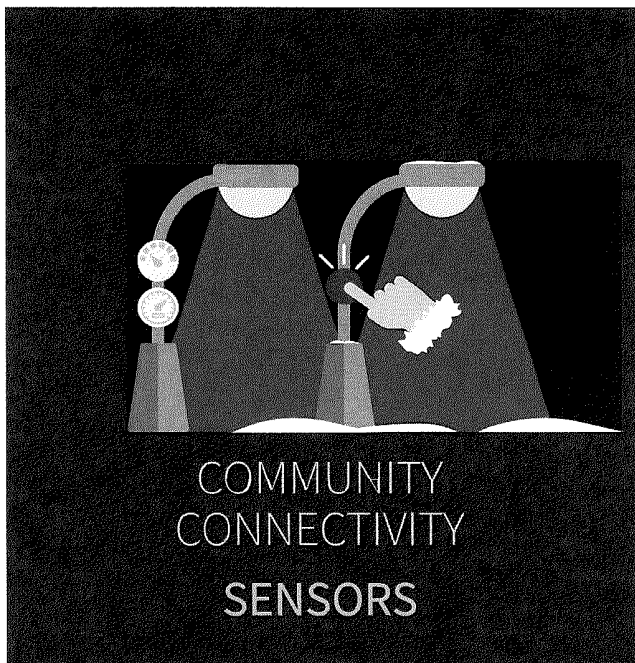
This mesh network will enable improvements to municipal services such as delivery of water, collection of sewage, and monitoring and maintenance of roads and trails (not just snow clearing, but drainage, permafrost damage, traffic flows

and streetlight controls). Contractors of services such as waste collection, electricity, fuel, trucked water and sewer delivery could use data to improve services and reduce costs. Further down the road the City envisions opening up the mesh network capabilities and information to businesses and innovators to test applications in the harsh and unique set of northern circumstances. This will create economic benefits and build a knowledge and information based economic hub that puts Yellowknife into the forefront as a small, well controlled laboratory for innovation in Smart Cities technology.

None of this is without risk. The City must ensure its strategy and policy are sound and that Council, Administration and citizens of Yellowknife understand the Smart Cities Vision. Openness and transparency are paramount to gaining trust and confidence in this vision. To do this will take an investment of money, staff and time to ensure the strategic building blocks are in place, while engaging the public and stakeholders and field-testing and improving the technologies that will help build our Smart City.



Drawing by White Arkitekter showing a potential network between Smart Lampposts and data sensors for municipal waste collection in Yellowknife



SENSORS

The potential for lampposts to be the foundation of a smart city lies primarily in their ability to act as the network to move information gathered by a range of sensors. The following list of potential sensors was informed by research from our technology partners. There is a vast and growing list of technologies that are possible here, and they are further expanded by creativity and circumstance in how they might be used. This category is intentionally large in order to demonstrate that this smart cities project has potential beyond the scope of this funding and timeline. The intention of Yellowknife is to use sensors to improve municipal services first, outsourced services second and open it up to the limitless possibilities of entrepreneurs in the tech industry when the conditions are right.

PIPED WATER LEAK DETECTION

It is estimated by the Public Works Department that 30% of the city's water is lost to leaks in the system. Aging infrastructure, exacerbated by the challenges of permafrost contribute to the pipe-water system inefficiencies. The cost of this water loss to city finances is measured in hundreds of thousands of dollars a year.

The installation of a smart sensor onto existing fire hydrants provides a promising leak detection monitoring solution already in use in Medicine

SENSOR TECHNOLOGY

TEMPERATURE, HUMIDITY, CO2



Climatic data

- monitor climatic changes
- forest fire smoke detection
- pollution level

LIGHT POLLUTION METER



Brightness of the night sky

- monitor light pollution
- data for astronomy

PARKING OCCUPANCY



Vehicle detection in parking spaces

- monitor vehicle data
- parking lot occupancy in real-time

WATER LEAK DETECTION



Water leak detection in water conducts

- measure water consumption
- wireless water conservation

LEVEL DISPLACEMENT



Measures distance to objects

- snow fall monitoring
- ice on roads

WASTE BIN DETECTOR



Collection efficiency

- waste management
- help public works
- full/ empty/ flame risk/ fallen

PUSH BUTTON



Multi-purpose buttons linked to different functions

- survey on satisfaction
- panic button
- control lights

METER READING



monitor consumption

- electricity monitoring
- gas fuel tank
- disfunction detection
- comparison of data

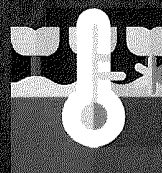
MOTION DETECTOR



Movement of people or objects in a 4 meter radius

- dimmable lighting control
- efficiency of the lighting strategy
- pedestrian safety

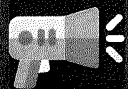
PERMAFROST



Permafrost temperature measurement

- data for geologist
- monitor changes in permafrost
- thermistor reading

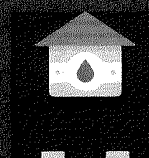
NOISE METER



Noise level in dB

- monitor noisy/quiet spots

WATER/SEWER LEVEL



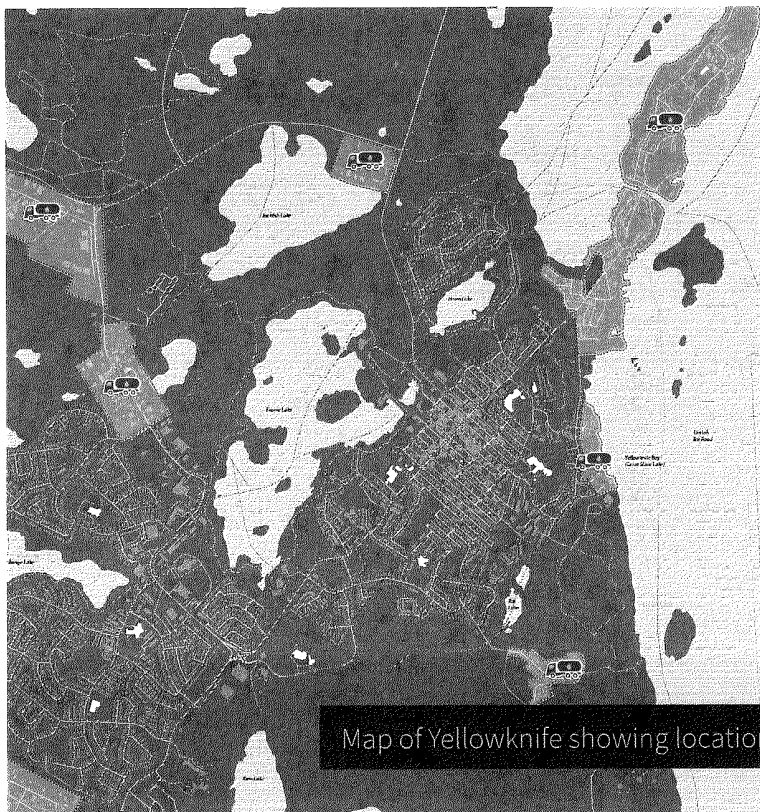
trucked water efficiency

- water/sewer tank level
- measure water consumption

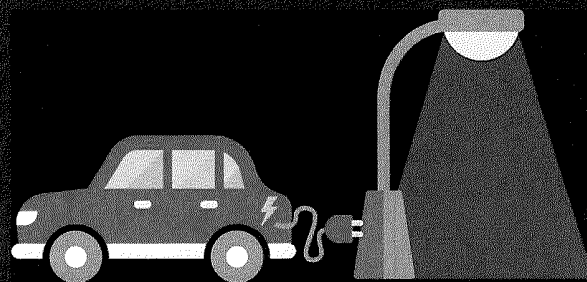
Hat, Alberta. A portable node uses an acoustic sensor to monitor the sound emitted by water flow in the hydrant and attached piping system. It is highly sensitive to acoustic variation and is capable of detecting even the faintest leaks that traditional monitoring systems often miss. In addition to the sensor itself, the node includes analysis software that monitors the progression of the leak over time. A network of lampposts that would transmit this data to a central data center would enable improved real-time leak detection and potentially save the City considerable time and money.

WATER LEVEL MONITORING

Rather unique to the north, trucked water and sewage services fill and empty tanks in and under houses in permafrost areas. Roughly one quarter of Yellowknife houses, including all houses in Dettah and N'dilo, have water delivery on a bi-weekly schedule. This isn't always on an efficient schedule, and an on-demand service could potentially better service these residences using a sensor installed into tanks to relay water level information to the lamppost, and subsequently to the control centre and provider. Challenges with running out of water, and unnecessary service delivery could save citizen's money.



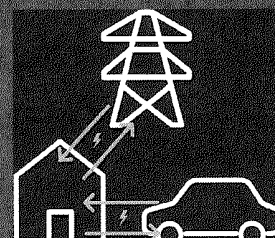
Map of Yellowknife showing locations of trucked water and wastewater



ELECTRIC VEHICLE CHARGING STATION

EV CHARGING STATION

The City of Yellowknife wants to be forward looking, and embracing electric vehicles (EV) as the future of vehicular transportation is part of becoming a Smart City. Generally there are two streams of thought on how to do this: incentivize EV purchases or build accessible charging infrastructure. The City is exploring the considerations of both options. Currently there are two EV charging stations in Yellowknife. The City recently installed a phase II charger at City Hall to charge a new electric vehicle owned and maintained by



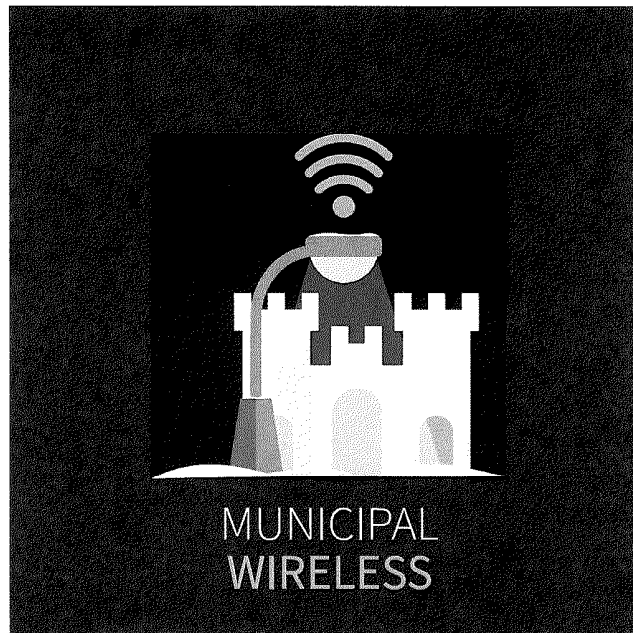
VEHICLE TO GRID

Vehicle-to-grid technology (V2G) helps to stabilize the energy grid through the installation of a new charging system for EVs. The battery of an EV becomes a mobile energy storage system that can supply energy to the grid during periods of high demand. Residents can be paid for the service their car offers to the grid. This is very promising to reduce diesel dependency in a lot of communities in the Northwest Territories.

the new YK Car Share Cooperative but available to City staff during working hours. This initiative will demonstrate the effectiveness of EVs to work in the frigid north and show leadership by the City.

Yellowknife is also working with Northlands Utilities to install one phase II EV charging station on a lamppost located in or in close proximity to the downtown core. The potential of EV charging stations integrated into lampposts provides promise for broadening the demand and possibilities of EVs as electricity becomes the standard fuel of the next decade.

Not anticipated in the timeline of this project, nevertheless a future potential application of EV connectivity via lampposts is vehicle-to-grid energy management technology. Piloted successfully in Copenhagen in 2016, this technology allows electric vehicles to act as mobile energy solutions. When not in use, the vehicle is plugged into stations that connect to a city's energy grid and enables them to provide excess energy to the grid or receive energy if necessary. This optimizes the power available to the grid and is especially useful in the case of unexpected surges in power usage (Automotive World, 2016).

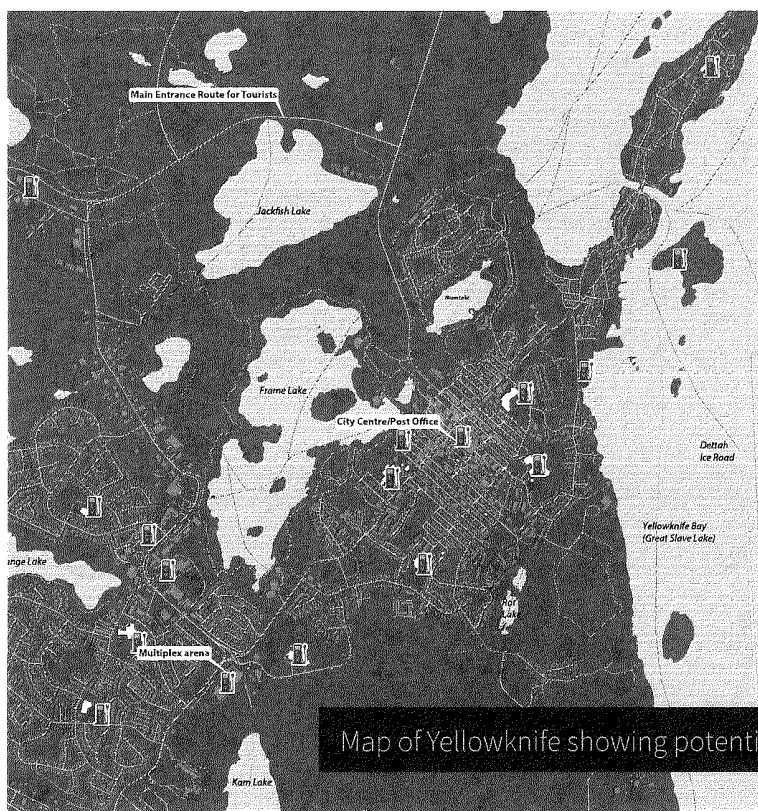


WIFI

Incorporating WiFi access points into lampposts in key junctures in the City will broaden the existing free municipal wireless network limited to municipal facilities. Exploring how to make digital services more accessible will increase wellbeing for both residents and tourists. The sharing of information is pivotal to the transition towards a smart city.

This is simple technology and easy to replicate and build on. Although not a key part of the Cities Smart City vision, it is another example of the ability of the lamppost to provide services and transmit information. Currently, there are six municipal locations in the city that offer free WiFi: Center Square Mall, the Library, City Hall, Samba K'e park, the Multiplex, and the Fieldhouse. After engaging with residents during a two-day Design Charette in August, 2018 several more sites were put forward as locations where WiFi would be useful: the Snow Castle, Old Town, the Government Dock, the Airport, and the Boat Launch at the Yacht Club. The City is considering the extension of its WiFi at the Snow Castle to improve the experience for tourists and locals at this key tourist location.

The creation of wireless connectivity between lampposts is a solution which could implement multiple smart city services that require a mesh

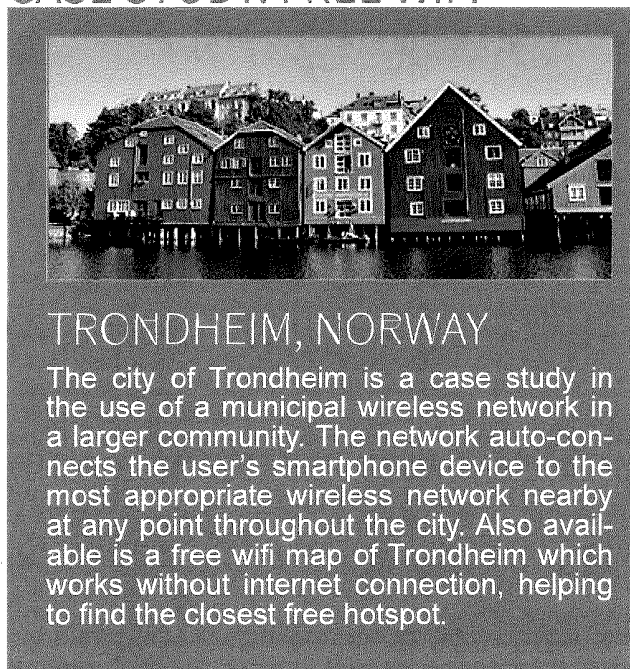


Map of Yellowknife showing potential locations for EV charging stations



network as a foundation. With the expansion of the public municipal wireless network come several risks, both to the user and the owner. These might include Man in the Middle Attacks (MitM), snooping/sniffing, and malware distribution. The City can help to limit these risks through public education. Risks to the network owner include bandwidth and network abuse (i.e. Denial of Service) and the possible use of the network for cyberattacks (O'Higgins, 2016). Public WiFi operators can protect themselves from liability of network misuse by implementing Terms and Conditions of Use Policies which includes: an indemnity statement, an acceptable use policy, a privacy statement, and a description of service level commitments (O'Higgins, 2016).

CASE STUDY: FREE WIFI



TRONDHEIM, NORWAY

The city of Trondheim is a case study in the use of a municipal wireless network in a larger community. The network auto-connects the user's smartphone device to the most appropriate wireless network nearby at any point throughout the city. Also available is a free wifi map of Trondheim which works without internet connection, helping to find the closest free hotspot.



GEOFENCING & BEACON TECHNOLOGY

GEOFENCING AND BEACON TECHNOLOGY

Geofencing and beacon technologies are platforms for public engagement and ultimately work towards this project's goal of developing an active and informed community. The more immediately available and realizable of the two technologies is geofencing. Geofences are fixed regions that define an area with a width between 200 meters and 2 kilometers on a map. Using GPS technology and cellular coverage, when a user of the associated mobile application passes into that region, they will receive a notification on their device. The notification, or broadcast, is a short 140 character or less message whose contents are defined as part of the geofence. The associated application in Yellowknife is the PingStreet app which is free and widely available to residents. The feasibility of implementing geofences has been demonstrated by the installation of 3 active geofences within the City of Yellowknife. While these geofences do not currently have any associated broadcasts, their broadcasting capability

has been piloted with over 1500 subscribers. Expanding this capacity using the smart lamppost infrastructure would increase the City's ability to engage directly with residents to share information like pool schedules, road closure alerts, and event notifications. One of the geofences that is active currently is at the Yellowknives Dene First Nation. They have expressed interest in using the geofence to broadcast cultural events throughout the year to both tourists and residents. This tech collaboration with a First Nations organization is an important feature of this project's replicability in other northern contexts.

A beacon uses bluetooth technology to broadcast a push notification that is triggered when the user comes within a radius of 3 to 25 meters of the beacon. It functions in essentially the same way as a geofence and, within the context of this project, is especially useful for tourism due to the small broadcasting radius. A series of beacon disks installed in lampposts near historical or geographical points of interest could act as an automated active walking tour of the City. It is important to note that users of the PingStreet app would be required to give their consent to receiving notifications from the City via both geofence and beacon broadcasting.

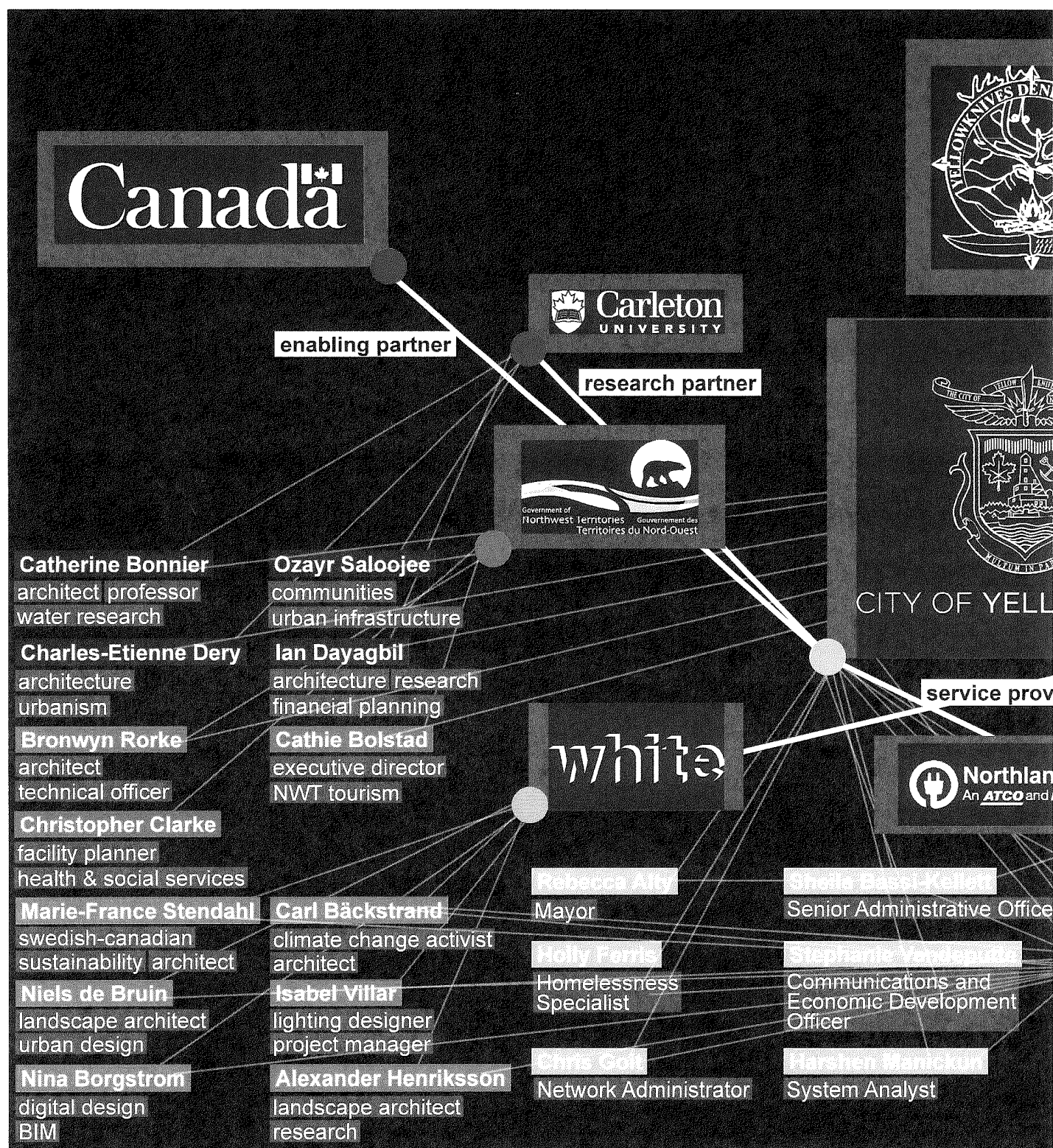
RISKS AND MITIGATION

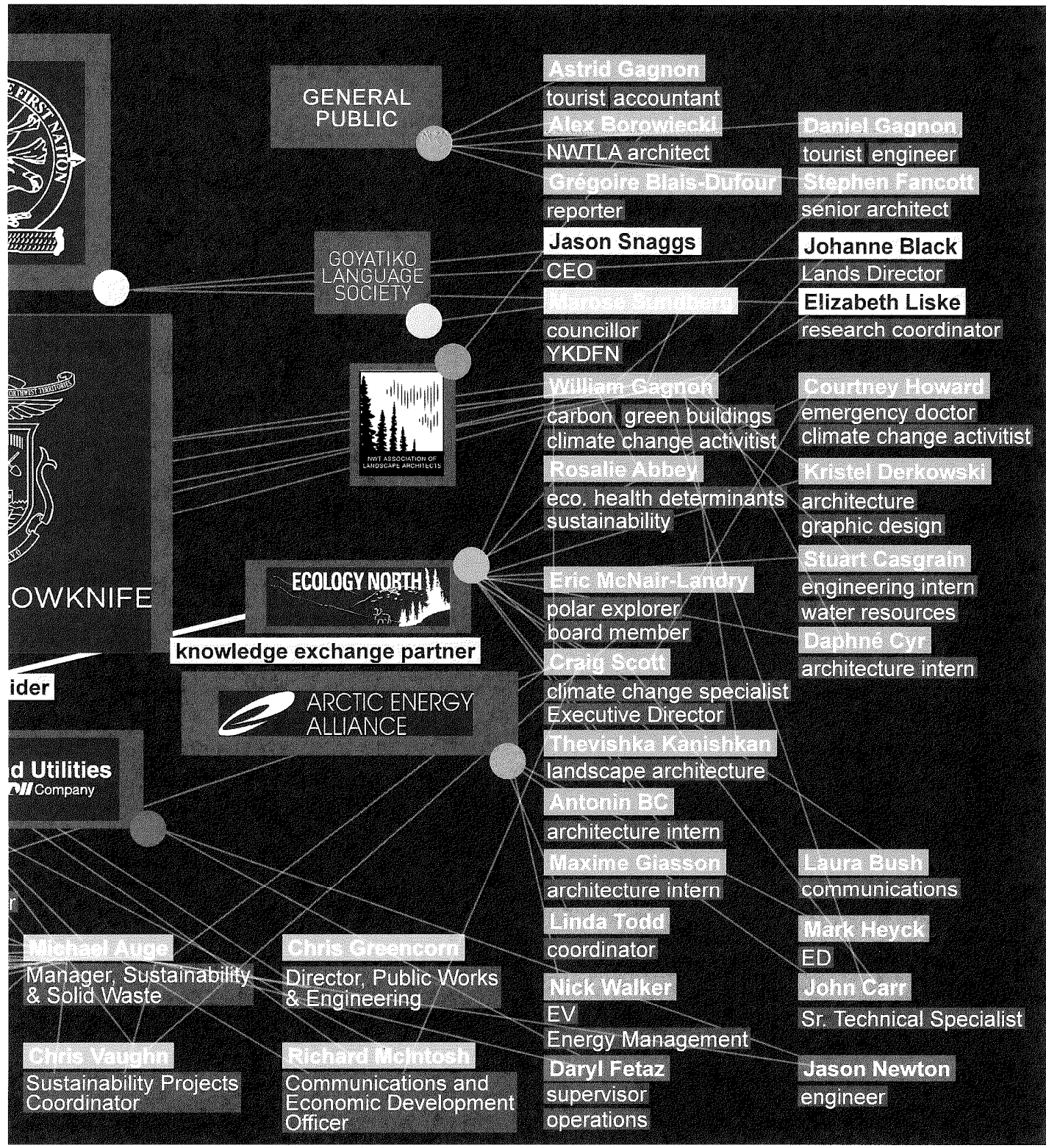
The standard risk associated with geofences and beacon technology is user privacy. Especially for those who are more technology illiterate, a push notification from the City, even if a consent gateway is established, could be seen as a privacy threat. This project has and will continue to take steps to mitigate the real and perceived risk of this. The City will remain vigilant and up to date on all of their IT systems. We are already in communication with the Office of the Information and Privacy Commissioner of the Northwest Territories regarding the completion of a Privacy Impact Assessment. Privacy concerns such as these are addressed more fully in the Data and Privacy chapter of this proposal.

QUOTE

"Dimmable city lights!! How about an application that we could use to get alert when awesome northern lights are showing up."

- Yellowknife citizen





CHAPTER 5

GOVERNANCE

Collaborative innovation happens when there is a need or a problem whose solution requires creative input from an array of stakeholders. The City's Smart City Vision encompasses the ideas, concerns and expertise of our indigenous peoples, our local environmental non-profits, our utilities and international support. Smart Cities are increasingly complex, with an ever higher number of stakeholders who hold diverging and converging interests. To manage these diverse partners and stakeholders, a rigorous governance framework is necessary.

The organizing priority of this project's strategy is to maximize the opportunity presented by the Smart Cities Challenge in order to produce the most benefit for residents of the City of Yellowknife. Ensuring security and transparency of the process, the outputs, and data collected is an essential component of this strategy. Any resources put towards realization of smart city outcomes will be filtered through a governance structure created to secure these aims. A template for Smart Cities governance can be found in the Sustainable Development for Communities guidelines document published by the International Organization for Standardization, ISO 37106:2018. This set of guidelines "establishes requirements for a management system for sustainable development in communities, including cities, using a holistic approach, with a view to ensuring consistency with the sustainable development policy of communities." (ISO website)

LOCAL AND HORIZONTAL GOVERNANCE

Strategic plans will be developed in alignment with City Council mission and the community's vision, as well as ISO standards. Creating a locally relevant governance framework is essential to the success of the overall implementation strategy. The approach thus far has been to prioritize a

horizontal partnership structure with several different parties and stakeholders. This horizontal structure aligns with the City's vision of an inclusive and well-managed community which is welcoming and inclusive. As both a centre of government, law, health and social services, the City's traffic and density are unique within the context of northern Canada. This presents a set of governance challenges that are similarly unique. By meeting these challenges with a horizontal governance approach, this project is aiming to ensure that all frameworks are transparent, efficient, and reflective of the needs of the community.

The governance structure of this project is intended to formalize the roles of partners and stakeholders via the creation of a Smart City Committee. The concept for this committee was introduced in the performance measurement chapter of this proposal. This committee will provide direction and information throughout the lifetime of the project, both during the 5 year scope of this proposal and beyond.

PROJECT PARTNERS:

YELLOWKNIVES DENE FIRST NATION

"Weledeh Yellowknives Dene are one of the peoples of the T'satsaot'ine. The people were known for the pots, knives, and other tools they made from copper collected in the northerly parts of their territory. Before trapping for the fur trade changed traditional occupancy and land-use pattern north of Tinde'e (Great Slave Lake), the traditional territory of the T'satsaot'ine consisted of lands around Great Slave Lake north to the Coppermine River, and east to the Thelon River. Since 1959, descendants of the T'satsaot'ine tribe have lived mostly at Deninu Kue, Rocher River, Lutsel K'e, Reliance, Ndilo, Dettah and Enodah. Today, the people call themselves and their territory after the great T'satsaot'ine leader Akeh-Cho: The Akaitcho Peoples and Akaitcho Territory." (excerpt from ykdene.com)

This project is an opportunity to strengthen partnerships with the Yellowknives Dene First Nation (YKDFN) neighbours and to achieve inclusivity, horizontality, transparency and a mutually beneficial arrangement that is in the best interest of residents of Yellowknife, N'Dilq and Dettah. Moving towards a holistic and inclusive framework for partnership with our First Nations neighbors is a consideration of critical importance for this project. To this end, YKDFN staff was present during the design charette and the YKDFN community was backed financially by a portion of the \$250,000 grant from the first phase of the Smart Cities Challenge. Moving forward, YKDFN participation will be an enabling partnership, in which the City would share resources and try to encourage a continuation of smart city tech into N'Dilq.

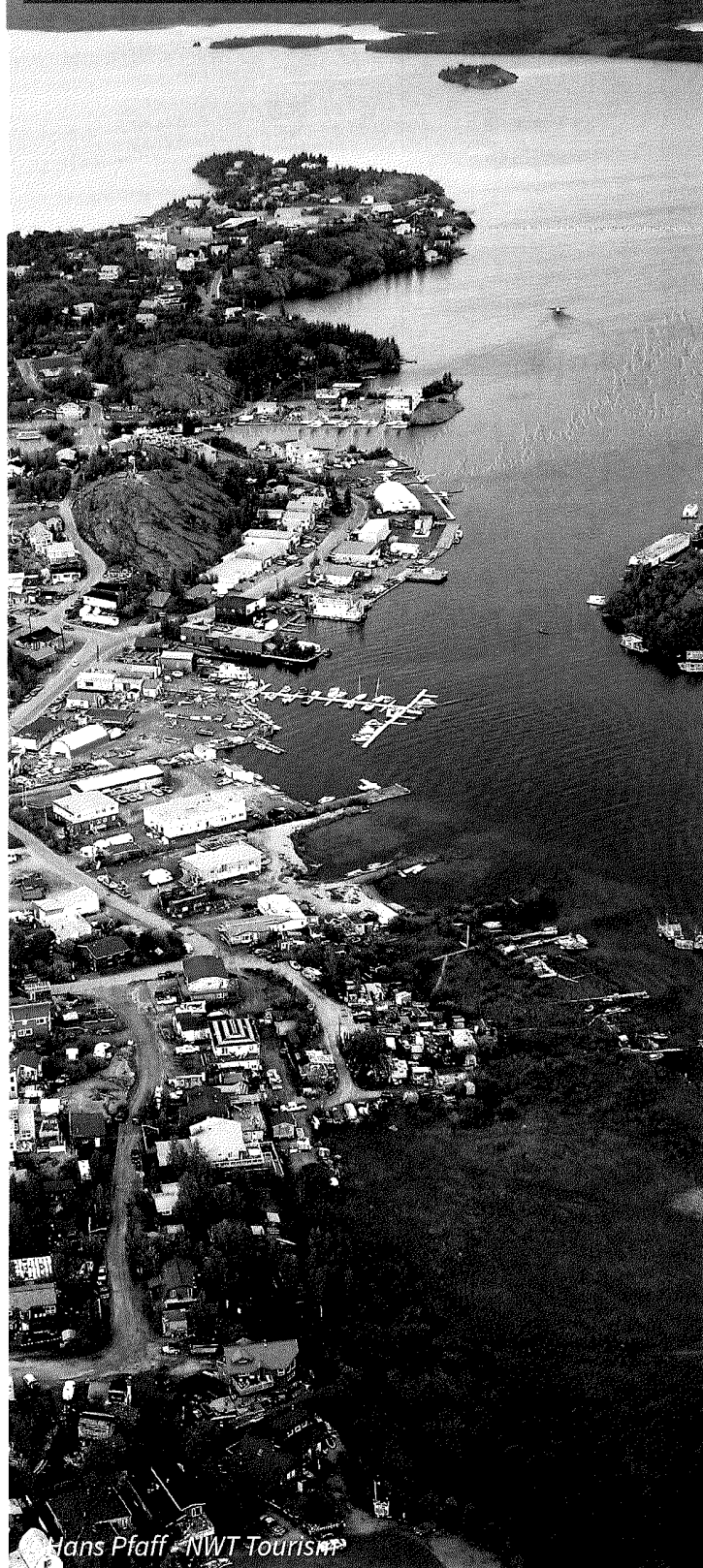
ECOLOGY NORTH

Ecology North was founded in 1971 in Yellowknife. Over the years the organization has served the City of Yellowknife as the pre-eminent environmental non-profit organization in the North. Ecology North has developed a strong relationship and partnership with the City of Yellowknife, working closely together on many projects, such as the municipal recycling and composting programs, this Smart Cities Challenge, and many co-hosted events throughout the years. As an organization, Ecology North is also active in City of Yellowknife committees and consultation sessions. As a non-profit, Ecology North has a horizontal, inclusive process for decision-making and includes stakeholders and residents in the decision-making process, incorporating diverse perspectives. For this Smart Cities Challenge, the partnership with Ecology North has provided a network for knowledge exchange on sustainable principles. They have facilitated knowledge exchange with the Scandinavian architecture firm White Arkitekter and the Carleton University Urban Research Lab.

NORTHERN CENTRE FOR SUSTAINABILITY

Ecology North and YKDFN are currently partnered on another relevant initiative that will re-

Photo of Yellowknife's Old Town and Great Slave Lake in the summer



Hans Pfaff - NWT Tourism

inforce the outcomes of the Smart Cities project. The Northern Centre for Sustainability (NCFS) is a project that will leverage federal, private sector and academic funding to build the first Living Building in the circumpolar North, and the first carbon-negative building in Canada. This building will be a demonstration in downtown Yellowknife for replicable, scalable, and adaptable cutting-edge technology for northern settings. An innovation hub in the building will be an incubator for emerging green businesses, entrepreneurs, special interest groups, and indigenous youth. By providing a space for innovation, the NCFS is positioning itself to be a potential Smart Cities partner.

WHITE ARKITEKTER AB

Ecology North has been developing research relations with the White Research Lab at White Arkitekter AB, the largest architecture firm in Scandinavia based in Gothenburg, Sweden. White is an expert in nordic design, and facilitates the transfer of knowledge and practices directly to local architects. White has acted as a sub-consultant to Ecology North as they provided them with case studies on Scandinavian Best Practices for electric vehicle charging stations, urban lighting systems, urban planning, urban

design, and the integration of the natural and built environments in the best way possible. Ecology North approached White for a partnership with this question: how can we exchange knowledge? To this point, White has provided much valuable perspective in the visioning of this project.

TECHNOLOGY PARTNER: NORTHLAND UTILITIES

Northland Utilities and their parent company ATCO have been the technology partners for this project since its inception providing technological expertise in the area of adaptive lighting strategies for the project's duration. Representatives from ATCO attended the 2-day design charrette in 2018 and have been involved in the ongoing feasibility studies, in the implementation of prototypes, and the monitoring and collection of data. ATCO states that "ensuring [they] operate in a transparent, ethical and accountable manner is critical in creating strong and sustainable value for [their] share owners and in promoting the company's well-being over the long-term" (ATCO, 2018). In addition to their technological expertise, this demonstrates ATCOs compatibility with this project's own scope and vision.



View of the Yellowknife skyline from Great Slave Lake in the winter

POTENTIAL ACADEMIC PARTNER: CARLETON RESEARCH LAB

The Carleton Urban Research Lab was co-founded in 2017 by Professor's Catherine Bonier and Ozayr Saloojee. The focus of the lab revolves around questions of water, cities and equity. It is both an academic and outreach unit in the Azrieli School of Architecture and Urbanism. The lab regularly hosts academic and public events through symposia, workshops and design charrettes. This proposal has benefitted from the expertise of the lab in the areas of Smart City technology, including risks and mitigation strategies and future-proofing, as well as in the areas of data and privacy and project management.

INCREASING CAPACITY

With increasing demand for municipal information technology services such as smart sensors and equipment through Internet of Things functionalities, the City of Yellowknife will be looking at hiring another coordinator in 2019 to increase capacity in this department.

SENSITIVE DATA

In order to retain community control over sensitive data, this project's approach to partnerships will prioritize in-house technology development and maintenance, and limit the number of vendors involved. The City of Yellowknife will retain initial ownership of the information collected through the Smart Cities Challenge infrastructure, and in accordance with applicable legislation, it will be up to City Council to decide on the use of this data. Additionally, part of the funding from this project will be directed toward creating a step-by-step guide for entities interested in buying data generated by Smart City infrastructure and using it for commercial purposes. Sequentially, this guide would need to be developed after the creation of a comprehensive IT Strategy Plan as discussed in the project management chapter. The process of ensuring that the sensitive data usage plan complies with the comprehensive IT Strategy will also be the purview of the Smart City Committee and will serve as a privacy and security "checkpoint" or opportunity for course correction and risk mitigation.



CHAPTER 6

ENGAGEMENT

Information technology can be an ever changing and mysterious thing, and the use of technology for the betterment of society can be fraught with challenges. The City of Yellowknife's engagement with residents and interest groups has been very positive, with lots of energy and excitement about the prospects of a Smart City in the north. But undertones of concern are present about privacy, use of data and the ever-present concept of "big brother." This chapter highlights the engagement to date, lessons learned, the plan to engage and communicate with Yellowknifers, and the vision and concepts of Smart Cities. Also highlighted are some of the risks and risk management techniques we are intending to use to get to the city's goals of using knowledge and technology to improve the community's social and environmental well-being by transforming the simple lamppost as a beacon of sustainability.

ENGAGEMENT TO DATE

Yellowknife is a small city that feels like a big town, and meetings between public officials and local citizens happen on the street or in the check-out line everyday. The City of Yellowknife approached engagement using its partners, in particular Ecology North, to get the word out about this project in a grassroots way. Grassroots engagement is effective at building a base of concerned and engaged citizens, that was built on through events, a multi-stakeholder charette and communication plan. The City will build on this approach by spending time in the first two years of the next phase of the project engaging and working with stakeholder groups to build trust in the City's approach, but also to gain feedback about how people see Smart Cities improving their lives.

This starts at the top, and City Council have been engaged and supportive from the very beginning. On April 23, 2018 council moved to unanimously

endorse the Smart Cities proposal (City of Yellowknife, 2018). Through close communication with City staff and partner organizations, Council has endorsed sustainable development, climate action and using technology to help improve outcomes for all Yellowknifers.

OPEN HOUSE

An Open House event took place on April 3rd 2018, just before the first proposal. Invitations were sent out widely with the objective of gaining ideas and thoughts on using the lamppost as a beacon of sustainability. ATCO demonstrated the technology with motion-sensing luminaires and Ecology North worked on generating ideas and building grassroots support.

We received over 50 individual responses to our request for feedback, and compiled and evaluated this information to help guide us in drafting our proposal. Residents identified key areas of concern, and discovered areas that had not been previously considered, which were incorporated into the project proposal. The community engagement Open House was an invaluable tool to understand the issues at the forefront of residents' minds, and allowed the partners to develop a project and potential solutions that truly meets the needs of Yellowknife.

MULTI-STAKEHOLDERS 2-DAY DESIGN RETREAT

In August of 2018, the Smart Cities Team organized a design retreat at the Yellowknife Ski Club. Taking the time away from computers and meetings would allow all participants' creativity to be stimulated, at the edge of the forest beside Great Slave Lake.



©Ecology North

Participants of the 2018 Multi-Stakeholders 2-Day Design Retreat

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Participants of the 2018 Multi-Stakeholders 2-Day Design Retreat



The full 2-day meeting welcomed participants from all walks of life to share ideas with an innovation mindset. The first day welcomed many Yellowknifers from a diverse range of groups, including but not limited to the tourism industry, academia, architects, landscape architects, and First Nations.

The second day of the charrette was more intimate, and focused on the technical details of implementing a smart street lighting strategy. Those in attendance had vested interest in the proposal, as they would be working on its implementation. This design charrette was a joint facilitation between Ecology North and White Arkitekter AB. Northlands Utilities delivered their knowledge of the lamppost system and technical know how, Yellowknives Dene First Nation shared their deep connection to the land and transformational thinking, and the architects, engineers, politicians, environmentalists, bureaucrats and everyday people brought their Northern innovation, ideas and comments to the table.

The community design charrette was developed to encourage sharing and open discussion through interactive activities. Facilitators initially sought to identify participants' perceptions of Yellowknife and build on the concept of sustainability in a Smart Cities construct, build on the concept of smart lighting that would improve people's connections with the sky and nature, and improve our thriving aurora tourism industry. Many new ideas were brought forward which were duly recorded and discussed and people were truly engaged and excited about the prospects of the Smart City and smart lighting. The full design charrette report is found on the City's Smart Cities Challenge website.

Our community engagement format enabled us to bring together participants from all our partner groups, along with their individual expertise. Participants who attended could engage

in discussions with all parties in a one-on-one or small group format. From these discussions, participants could better understand what exactly the Smart Cities Challenge was, some ideas already developed in terms of specific issues the City needed to address and potential ways to address these issues. Participants were invited to ask questions and provide feedback throughout the one-on-one engagement, and then after they had a chance to interact with all the partners as well.

Some guiding questions were displayed on different boards throughout the room and people were invited to write their action ideas on a post-it note for each one they wanted.

Though we invited attendees to answer these questions directly, we also encouraged them to provide further feedback that they might have had. The amount of feedback we received impressed us. On top of this, we engaged a local radio station, Cabin Radio, to attend the first hour of our session and broadcast the entire time through Facebook live to encourage more residents to come. Thanks to our varied promotional methods, we saw solid attendance at the engagement session and received feedback that has helped guide our proposal.

LIGHTS OUT EVENT

On November 20th, in what is one of the darkest and gloomiest times of year, the City held a Lights Out Event to bring awareness and excitement about how light pollution impacts the city, and how the Smart City Challenge intends to tackle lighting issues. The City turned out the lights of City Hall and Samba K'e Park to symbolize future efforts and showcase the night sky. Mother nature had other ideas on this blustery evening, but regardless a good turnout and interesting conversations about what night means to Yellowknife were had.

CONSULTATIONS AND SIDE CONVERSATIONS

Yellowknife is blessed to have what must be one of the most engaged populations in Canada. This is seen in the number of civil society organizations that work to improve all manner of social, environmental and other disparities and challenges. By choosing to work with Ecology North on this project, the grassroots of the environmental movement were engaged. Ongoing engagement with tourism providers and NWT tourism helped the team understand the tourism opportunities and challenges. Northlands brought the knowledge and tools of its Innovation Hubs to the table.

YELLOWKNIVES DENE FIRST NATION

Yellowknife is founded on Chief Drygeese traditional territory of the Yellowknives Dene First Nation (YKDFN). The twin communities of N'dilo and Dettah share borders, and many YKDFN residents live and work in Yellowknife. The City and YKDFN also work closely on shared infrastructure, festivals, and building a better overall community together. YKDFN were invited to all consultation sessions and participated in the Design Charrette, where ideas and plans to incorporate technologies into N'dilo were conceived and developed. Relationship building around a shared vision has continued with discussions at the leadership level, and at the grassroots between Ecology North and YKDFN staff.

The Smart Cities project will further build on this relationship by bringing principles of reconciliation to the project by actively partnering and sharing resources gained from the Smart Cities Challenge. The City and YKDFN are looking to



Participants of the 2018 Multi-Stakeholders 2-Day Design Retreat

©Ecology North

forge a new bond based on the promise of technology, a growing tourism industry and celebrating culture and heritage.

SOCIAL MEDIA

The City has a communication plan, and has been working on tools to further its engagement using social media, traditional media and other tools such as Placespeak and the Pingstreet app. This is a weakness the City has had to date, developing and enacting this Communication Plan. The process of researching, learning and developing what this proposal will look like for the City is an iterative one. The City wants to be clear with regards to its Smart Cities messaging in order to best manage expectations.

DIMMABLE LIGHTING SCHOOL DRAW PROTOTYPE

As our flagship prototype the School Draw dimmable light installation will highlight a new look for streetscapes in town. The City intends to use this project to highlight the Smart City project and

show residents how this technology will improve the night time experience for Yellowknifers and tourists.

To evaluate and build public support for this prototype Ecology North and City Staff interact with residents in the pilot area to explain the project, answer the inevitable questions about what people in the neighbourhood are going to experience and help the team understand people's concerns while building excitement around this prototype. By asking for written feedback, we hope to develop a baseline of knowledge and concerns, and will follow that up after the prototype to evaluate people's experience with the lights, and whether it changed their enjoyment of Yellowknife's Extraordinary Skies.

The City will also celebrate reaching this milestone with a celebratory event in which the partners and the public will get to see the lights working for the first time. This will be the first time that the public will visibly see a manifestation of what their City can look with smart lighting.

CITIZEN QUOTE

"I think it is a brilliant idea. I think it's great... We were just talking about how to integrate services for bicycles, because a lot of us are year-round bikers."

- Aleta, Yellowknife resident

Cabin Radio's Ollie Williams interviewing Aleta, Yellowknife resident, at the April 2018 Open House



FUTURE ENGAGEMENT

Smart Cities are a relatively new concept and a challenging one to define and communicate. The City has chosen not to immediately communicate a Smart City strategy and concepts that are not yet fully developed, but anticipate following the ISO 37106:2018 standard and developing an IT Strategy in the first year of implementation to improve communication and engagement that will follow.

The City at this point without pre-supposing the future strategy and policy direction hopes to embrace concepts of openness, transparency, interoperability, non-proprietary and citizen-centric IT and similar themes for engagement. Tools and strategies will be developed to embed this view so the City becomes a leader in working with its citizens to improve outcomes for everyone. To improve this the City will continually ask for input into new ways to incorporate Smart Cities concepts into its strategies and action plans.

Approaches that the City intends to take to get to this point will be to use our current engagement and outreach tools to gather knowledge. These include Placespeak which is a location based civic engagement platform, and the app PingStreet which provides real-time access to helpful information and engaging tools. Along with ubiquitous social media outlets like Facebook, Twitter, Instagram, and the Smart City Yellowknife website, the City will continue to use the person to person, and stakeholder engagement that have been the main platform for engagement to date to communicate the Smart City message.

The plan will lay the groundwork for the use of other tools within the City to reach out to new stakeholder groups. By developing a Research and Engagement Working Group to promote this plan, the City will encourage the public, entrepreneurs, and targeted stakeholder groups to submit expressions of interest and ideas to make the City

smarter. Funding in the form of an engagement budget will be provided in years 1 to 5 and each year there will be a different focus (transportation, IT, sensors and tourism, etc) in which the public will be asked in a challenge format to give the City practical, doable ideas for implementation. Other uses of the funds from the engagement budget might be to ask stakeholder groups (ie. artist community to use art to highlight smart city prototypes) or ask seniors to test a technology or envision what a smart city is for them, or hosting workshops for youth to work with technology. Other options might be to host a hackathon in which tech entrepreneurs, or university students from across the country are invited to participate to build solutions that fall within the criteria of our Smart City Vision and concepts.

Other engagement tactics could be to talk with random citizens and ask them how a Smart City or smart streetlights might improve their health, safety or sense of being. Similarly, working with new immigrants to see what needs or wants would make their early transitional years easier could shed light onto areas of improvement. To do all this the Smart Cities Implementation budget will support real hands on learning, workshops, participation with schools and civil society groups. Each of these stakeholder groups brings will attempt to bring out individuals and groups of

CHAPTER 7

DATA & PRIVACY

PREPARING A PRIVACY IMPACT ASSESSMENT

Part of this strategy is communicating with the Office of the Privacy Commissioner (OPC) to prepare a Privacy Impact Assessment (PIA) that covers the width and breadth of this project. As part of the preparation process for this proposal, the City of Yellowknife has established contact with the OPC and through initial discussions determined that a PIA was not needed at this stage of the project as data is yet to be collected and no privacy impacts are being made. City staff will continue to work closely with the OPC as the project progresses to determine which technologies and aspects of the project require PIAs and to perform this work as necessary prior to the implementation of any potential Smart Cities technologies.

EXISTING POLICY

The City of Yellowknife has established and made public their efforts to integrate security and privacy considerations into municipal technology. This is evidenced in the City's website's privacy policy, which notes user de-identification and gives a complete list of the non-identifying information that is recorded. This sets a precedent for data privacy and security that the Smart Cities Project can expand on. Because the majority of the technologies proposed in this project are not currently in use, their privacy impacts will have to be evaluated by the City or by an independent contractor before they are officially launched.

With regards to compliance with The Personal Information Protection and Electronic Documents Act (PIPEDA), this project in its current iteration does not deal with any personal information. As part of the project management strategy, however, this should be reassessed periodically.

CASE STUDY:

ILLINOIS INSTITUTE OF TECHNOLOGY

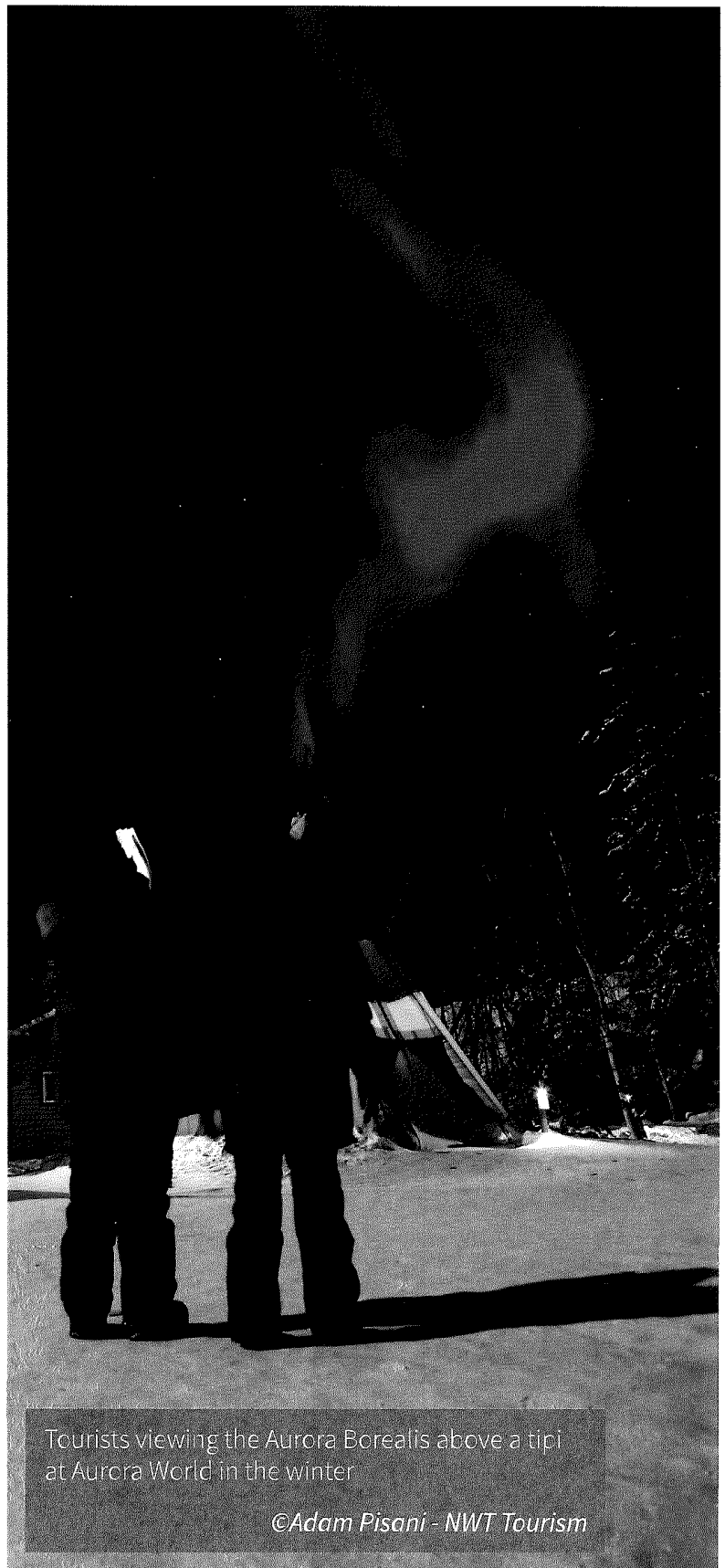
The Illinois Institute of Technology (IIT) has designated the campus a "living laboratory" by building a microgrid on IIT's main campus to experiment with smart technologies. IIT is currently piloting a smart street lighting system configured in a mesh network that communicates with lights that are controlled by the Centre-for Smart-grid Applications.

IIT has also piloted two prototype applications (a) emergency response application, and (b) Safewalks mobile application. The Safewalks application adjusts the brightness of streetlights relative to the pedestrian traffic as determined by real-time data.

IIT is particularly interested in cyber-security for their networked streetlight system. They have identified three areas of vulnerability: (a) the communication network, (b) the remote server, and (c) end devices. Smart software is important in maximizing the utility of smart hardware. Cybersecurity is the most important concern of IoT in critical services that addresses interests of public trust.

SMART CITIES CHALLENGE: AN OPPORTUNITY

Collectively the municipality and its partners recognize the Smart Cities Challenge as an opportunity to preemptively address emerging issues regarding technology, ownership and security. As a frontrunner in specifically Northern-Canadian innovation, Yellowknife is well-poised to develop secure frameworks of governance with the well-being of its residents as a central priority. The governance structure ensures diligent and consistent dialogue with a diverse range of residents and stakeholders. The City's commitment to accessible, open-source formats is demonstrated in existing infrastructure like the City Explorer portal and Open Data License Agreement. Moving forward, the development of an IT implementation Strategy can provide the opportunity to solidify a long-term practical approach to secure data management. Emphasis will be placed on ownership structures that retain municipal control of data, as well as a framework for adaptability of open-source policies to suit changing needs and technologies. Investing in smart solutions for the Yellowknife context translates readily to applications in remote and cold-weather communities across the country.



Tourists viewing the Aurora Borealis above a tipi
at Aurora World in the winter

©Adam Pisani - NWT Tourism

CHAPTER 8

FINANCIAL

Transforming into a Smart City has the potential to improve the services the City offers its citizens and improve the way it offers those services. It will help the City improve internal efficiency by providing more effective structures for communication and data transfer. The up-front investment required to implement these improvements will be paid back through a variety of benefits and service improvements in the future. The following preliminary budget will highlight the estimated costs and the outcomes and some anticipated cost savings that will be triggered within the five year Financial Plan of the City. The preliminary budget is summarized in the budget document on page 66, and will be split generally into the following five sections: Smart Cities Strategy, Extraordinary Yellowknife Lighting Strategy, EV incentivization Strategy, Research and Engagement and Operations & Maintenance budget lines.

SMART CITIES STRATEGY

The Smart Cities Budget will be the largest single budget area and will encompass much of the technology that most people think of when they envision a Smart City. Consistent with the proposal this preliminary budget will not provide too much detail into the costs of individual technologies, as decisions will depend on the Smart City Strategy, research and engagement and the approach to implement the action plan coming out of the strategy. This approach maintains flexibility and doesn't pre-suppose the outcomes. Dollar figures will be used to limit the scale of technological deployment within the five year budgeting window.

The budget for Smart Cities Strategy will include the Strategy itself and development of corresponding IT policy and tools. There are also improvements to Information Technology within the City itself, namely improving the IT hub, connectivity improvements, and expanding the gateways

city-wide. Further to these key improvements, the Strategy and further research will highlight approaches (and estimated budget lines) to mesh network development, expansion of geofencing, beacon technology, wifi expansion, sensors and new technology areas.

EXTRAORDINARY YELLOWKNIFE LIGHTING STRATEGY

Similar to the Smart Cities budget the Extraordinary Yellowknife lighting budget will be dependent to a degree on the strategy and lighting plan developed in the first year. This strategy will highlight priority areas within the city and set the conditions for expansion of the smart lighting, based on the evaluation of the School Draw prototype and lighting strategy. Budget lines for lighting have been included in the budget page and will be a considerable portion of the budget.

ELECTRIC VEHICLE INCENTIVIZATION STRATEGY

A relatively small portion of the budget, the EV Incentivization Plan will highlight a Smart City approach to Electric Vehicle integration into Yellowknife. This will primarily entail piloting and evaluating EV charging infrastructure tied to lampposts and how to leverage this with policy, education and awareness tools to encourage adoption of EV's into a Smart Cities framework.

RESEARCH AND ENGAGEMENT BUDGET

Included in the preliminary budget for this project, which is detailed on the following pages, are considerations for research and engagement. In contrast to the technological projects and associated budgets, the project areas of research and engagement are intrinsically less clearly defined. Maintaining public and private engagement and promoting strategic research around the availability and feasibility of various Smart Cities tools and technologies is an essential component to the success of this project, and will require an

ongoing budget. Funding will be allocated for research and engagement purposes through the guidance of the Yellowknife Smart City Committee. Decisions on allocating the annual funding to meet the intent and vision behind a Smart Cities framework will be made using an effective, varied and multi-stakeholder approach.

OPERATIONS & MAINTENANCE

The City is going to need the capacity and a coordinator. The Smart Cities Coordinator will be housed in the Sustainability branch of the Public Works and Engineering Department, which is responsible for community energy, waste and broader sustainability initiatives. The Smart Cities Coordinator will manage contracts, coordinate the committees and working groups, coordinate between departments and partners, and general project management of the the Smart Cities project. There will be additional requirements in other departments such as IT, Communications, Public Works and Planning that will be coordinated by the internal existing budgets of those departments.

CASE STUDY: THE COLUMBUS WAY

In 2016 Columbus, Ohio won a \$40M fund from the US Department of Transportation. The non-profit organization that won the bid raised an additional \$450M by leveraging public, private and academic associations to develop a Smart Columbus project focused on 'smart corridors', a smart grid and smart street lights. With a vision "to be the model for connected cities for the future" its approach to using narratives to engage citizens in a 'collective vision' from a central hub is a model that Yellowknife can aspire to.

CONSIDERATIONS FOR LONG-TERM OPERATIONS & MAINTENANCE COSTS

There are definitely concerns about the long-term costs of increasing the number of staff and operations budgets with additional technology, actions and engagement demands. Through the accounting and financing mechanism already in place, City Administration will continue to reassess and strategically invest in the Smart Cities project. It is envisioned that energy savings, water savings and improvements to municipal services will more than offset any future costs. Key to this project is developing clear baselines and evaluation protocols to understand, value and communicate the results of pilot projects to corroborate the argument and continue to receive public and council support for funding.

LEVERAGING THE SCC FUNDING

The City recently invested in an institutional grant writer and funding analyst. The role of this new position in relation to the Smart Cities is to support with the leveraging of the Smart City budget to expand the funds available for prototype development, technologies, engagement, research and IT. The goal will be to provide additional funding every year for the project and to extend the five year length of the funding to maximize outcomes for Yellowknife's Smart City evolution.

COST SAVINGS

Yellowknife will see improvements in the well being of citizens as the Smart City Plan is unrolled. There will also be corresponding financial savings that will be linked to the rollout of the technologies. Although it is not possible to fully forecast savings, due to the unknown nature of costs, this project anticipates savings on several fronts. The dimmable lighting will be more energy efficient than the current LED lighting. By dimming

the lights to a lower electrical load for the majority of the time, there is an anticipated savings of both energy and cost. Currently Northland Utilities owns the lampposts and rents them to the City. The smart streetlights will reduce energy which should translate in a cost savings to citizens.

The introduction of sensors linked to the mesh network will also help the City to reduce costs. Although it's too early to forecast what those savings might be, there is evidence to suggest that city services would be improved by sensors, and those cost savings could be reinvested to improve municipal service delivery. A few promising applications are in the early detection of water leaks, improving the efficiency of trucked water schedules, solid waste removal efficiency increases and trucked sewer pump-out. There are considerable costs to water treatment, but in Yellowknife an additional cost is heating the water to 4 degrees Celcius to help limit freezing as the water spreads out around the system. A conservative assumption of a 10% reduction would equal over \$20,000/yr saving and save 59 tonnes of CO2.

Another important positive impact though will be to improve the long term growth of the tourism industry. In 2017, aurora tourism brought in \$57 million to the Yellowknife economy. But the Aurora tourist economy is cyclical and there is more and more competition for lucrative aurora tourism visits. By taking a Smart Cities approach, installing smart lighting that makes Yellowknife's Extraordinary skies more visible, and providing beacon technology and other tourism products in the home language of aurora tourists, the City of Yellowknife will set itself apart from the competition and ensure a stronger tourism product and boost in revenues. Finally, the City is very excited to transform Yellowknife by putting the pieces in place for cold weather innovation in the Smart City realm. An innovation based knowledge economy will promote entrepreneurial and business opportunities, add a growing sector to the economy, reinvigorate the downtown, and make Yellowknife into a unique laboratory for Smart Cities innovation in a northern setting.

Another opportunity for potential is with ties to academia. The City is well positioned to improve partnerships with academia and the Smart Cities framework would be a big area of potential growth, as would the proposal to bring a Polytechnical University to Yellowknife, and how that campus could be grown from scratch as a Smart Campus. These ideas have not been fleshed out in this proposal but the City is eagerly anticipating opportunities to leverage the Smart Cities challenge into a new and burgeoning growth area in the City.

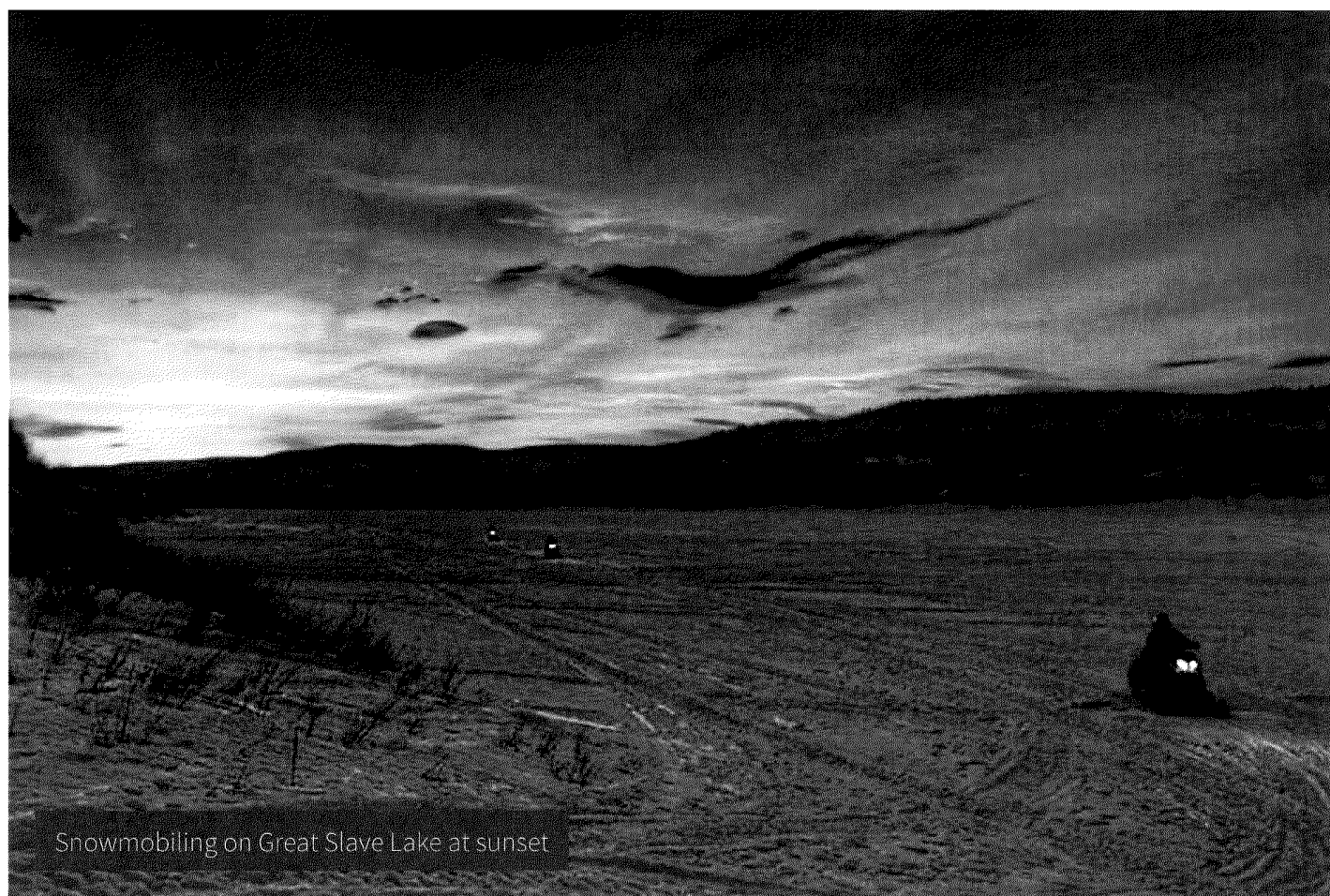
Approximately \$25,000 was budgetted for the pilot project of which half was dedicated to initial capital costs and the remaining for lights and installation. The installation of eight lights works out to approximately \$1,500 per light.

The \$5M award would provide us with the opportunity to scale up the project and expand through most areas of town, with a particular focus on residential neighbourhoods. Budgets, capacity and feedback would be continually considered to ensure that the project is in line with City goals and expectations of the Smart Cities funding requirements.

A more robust financial analysis will be linked to the updating of the City IT hub once recommendations brought forth by the IT Strategic Plan have been vetted by Administration and stakeholders.

As the City pushes the envelope for a more connected and innovated North, Administration will ensure that innovation and risk is balanced with financial accountability and continual verification to ensure that deliverables are relevant and that expectations are manageable.

Breakdown of \$250,000 Finalist Grant		
Design Charrette Facilitation and Expenses	\$	42,055.15
Drafting of Final Proposal	\$	75,000.00
Geofencing Pilot	\$	10,350.00
Finalist Video	\$	10,000.00
Jury Check-In (Toronto travel)	\$	2,000.00
Lamppost Pilot	\$	25,000.00
Engagement Misc. Cost (rental+food)	\$	1,000.00
YKDFN partnership	\$	25,000.00
Finalist In-Person and winner announcement	\$	10,000.00
staff time	\$	49,594.85
Total	\$	250,000.00



Snowmobiling on Great Slave Lake at sunset

PROPOSED YELLOWKNIFE SMART CITIES BUDGET

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Extraordinary Skies Action Plan						\$1,480,000
Lighting Plan for the City of Yellowknife Research, Design and Development of a Lighting Plan for the City of Yellowknife in partnership with local architects, designers and urban planners.	\$125,000		\$10,000		\$10,000	\$145,000
Light pollution baseline determination Assessment of current levels of light pollution based on available technologies, to be used as a baseline for the identification of quick turn-around deliverables, and for progress verification midway and at the end of the implementation plan.	\$15,000		\$10,000		\$10,000	\$35,000
Best Practices Guide for Dark Sky Compliance		\$15,000				
Lighting retrofit and upgrades implementation Retrofitting and upgrading existing lamp posts in neighbourhood based on lighting strategy and evaluation of pilot project		\$250,000	\$350,000	\$350,000	\$350,000	\$1,300,000
Information Technology Strategic Plan						\$1,345,000
Information Technology Strategic Plan, policy development and two year check-ins	\$75,000		\$20,000		\$20,000	\$115,000
Privacy Impact Assessment		\$50,000				
Information Hub technology improvements	\$20,000	\$60,000	\$20,000		\$20,000	\$120,000
Capital Investment for IT Backhaul on municipal infrastructure		\$250,000	\$250,000			\$500,000
Mesh Network lamppost technology installations			\$50,000	\$250,000	\$250,000	\$550,000
Geofencing and Beacon Technology Implementation		\$25,000	\$25,000	\$25,000	\$25,000	
WiFi hotspots	\$40,000	\$5,000	\$5,000	\$5,000	\$5,000	\$60,000
Electric Vehicle Penetration Action Plan						\$160,000
EV Penetration Strategy Communications, partnership building and implementation plan design	\$40,000					\$40,000

EV charging station installation equipment Capital investment for installation, operations and maintenance of electric vehicle charging stations and incentive tools as laid out in the EV Implementation Strategy Action Plan		\$30,000	\$30,000	\$30,000	\$30,000	\$120,000
Ongoing Research and Engagement						\$1,225,000
Baseline Progress Report of Sustainability Assessment of Yellowknife's performance on the UN SDGs, checkpoints and course correction reports	\$50,000		\$25,000		\$25,000	\$100,000
Research Budget Support third-party research to support Smart City Vision and IT Implementation Plan	\$125,000	\$125,000	\$125,000	\$125,000	\$125,000	\$625,000
Engagement Budget Implement Communications Plan and encourage engagement with targeted sectors	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$500,000
Operations & Maintenance						\$650,000
Staff salary (1PY) for Smart Cities project management	\$120,000	\$125,000	\$130,000	\$135,000	\$140,000	\$650,000
						\$710,000 \$1,035,000 \$1,150,000 \$1,020,000 \$1,110,000 \$5,025,000

CHAPTER 9

IMPLEMENTATION PHASE REQUIREMENTS

In this chapter the City of Yellowknife intends to show how it will meet requirements of applicable federal, territorial and municipal reporting and policy requirements.

DUTY TO CONSULT WITH INDIGENOUS GROUPS

The Duty to Consult with and accommodate Indigenous Peoples is required when the Crown contemplates actions or decisions that may impact treaty rights. Being a northern city with a close relationship with the Yellowknives Dene First Nation (YKDFN) with whom the City shares a border and with whom we count many shared citizens, it is critical that consultation and collaboration are consistent with the high ideals of both the Crown and the City.

To this end the City of Yellowknife is enthusiastic and proud to have YKDFN as partners in this project. YKDFN will participate in the governance of the project as part of the Smart City Committee and the community of N'dilo and Dettah will share opportunities to participate in the outcomes of the Smart City project.

The City has taken clear steps to include the YKDFN in the finalist stage of the proposal through the design charette and sharing the proposal for review with YKDFN. As a key partner YKDFN will play a key role in designing the strategies and outcomes as part of the Smart City Committee, and we anticipate showcasing YKDFN and Yellowknife history and culture in the engagement portion of the Smart Cities Implementation.

COMMUNITY EMPLOYMENT BENEFIT

Yellowknife's Smart Cities Challenge project intends to support employment opportunities for youth, Indigenous elders, artists, recent immigrants, youth and small-sized and medium-sized businesses and social enterprises. By having targeted workshops, technology based challenges, projects and contracts through the research and engagement budget, it is hoped that creative tools and engagement opportunities will encourage participation of targeted groups to build excitement and opportunities for inclusion into a Smart City. Participation will be tracked and specific engagement sessions and opportunities will be included.

Putting in place the conditions for innovation to flourish will allow for a rise in circular economy, green jobs and social innovation to take place. Turning Yellowknife into the Tourism Capital of the North will benefit all of Yellowknife and YKDFN, and the City will promote opportunities for cultural tourism. Yellowknife as a northern hub for innovation and a Smart City will set about the groundwork for a surge in small scale entrepreneurship, innovation and the knowledge economy.

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Yellowknife skyline on a summer night

City of Yellowknife – Smart Cities Challenge Proposal

Accessibility Text Descriptions for Images

Pg. 2 Table of Contents

An igloo surrounded by trees, underneath the northern lights

Pg. 4 Executive Summary

The participants of the design charrette in August 2018.

Pg. 6 Image

Man standing beneath the Aurora Borealis

Pg. 8 Extraordinary Skies

The northern lights hovering above a four-story building and a small house. The ground is covered in snow and there are stars in the sky. Beneath the graphic is the text “extraordinary skies.”

Pg. 9 Replicable Framework for Northern Innovation

A silhouette of the territories on a dark background with a signal radiating from the geographical location of Yellowknife. Beneath this graphic is the text “replicable framework for northern innovation.”

Pg. 9 Tourism Capital of the Canadian North

A person wearing a tuque and holding a large map that covers their face. The map says Extraordinary Yellowknife and beneath the graphic are the words “tourism capital of the Canadian north.”

Pg. 10 Community Connectivity

One large speech bubble with an illuminated light bulb above three smaller speech bubbles with a questions mark, a thumbs up, and a heart. Beneath the graphic is the text “community connectivity.”

Pg. 11 Leadership in Sustainability

A solar panel beneath a sun in the sky. Beneath the graphic is the text “leadership in sustainability.”

Pg. 11 Northern Lights

A ribbon of green Northern Lights above mountains.

Pg. 12 Map

A map of the city of Yellowknife that depicts the main landmarks of Somba K'e, City Hall, City Centre/post office, Tincan hill, Fire division, Rotary Centennial Park, Yvonne Quick Heritage Wharf, Bush Pilots monument, Snowking's Winter Festival, the main entrance to the city, and

the area selected for the lighting prototype. Additionally, there are icons on the map that locate the potential locations of the smart technology to be integrated into the light pole. These technologies are: municipal wireless, panic button, geofencing and beacon area, aurora selfie camera, light signals, EV charging station, and trucked water areas. Superimposed onto the map are lighting priority zones LPZ0 to LPZ4, four zones that move from areas most in need of protection from light pollution to least. There are also several aurora viewing spots on the map.

Pg. 15 Image

Tourists standing outside a teepee viewing the Northern Lights at Aurora Village.

Pg. 16 Performance Measurement

The performance measurement graphic outlines the flow and sequencing of the project in terms of inputs, activities, outputs, outcomes, and impacts. Many of the inputs and activities were associated with the application phase and finalist phase while certain activities as well as the outputs, outcomes, and impacts are the domain of this project proposal. The activities outlined for the \$5 million prizewinner phase will result in several outputs which are tangible deliverables. The outputs are detailed in the performance measurement chapter. The outputs flow into a description of the outcomes which are the medium-term impacts of the project. All of the outputs are associated with long-term impacts. The flow from output to outcome to impact is color coded to make clear to the viewer which outputs feed into which impacts. This is described in detail in the chapter ahead.

Pg. 21 International Dark Sky Places

A light pollution map of north America with the city of Yellowknife highlighted.

Pg. 22 Light pollution map

A light pollution map of the city of Yellowknife with select landmarks and designated aurora viewing locations highlighted.

Pg. 25 Outcomes payment timeline

A five-year timeline of deliverables divided into the five impact streams: replicable framework for northern innovation, extraordinary skies, tourism capital of the north, community connectivity, and leadership in sustainability.

Pg. 26 Project Management

A flow chart that outlines the progression of six selected activities from their initial to final phases. The six activities are (1) a city-wide mesh network (2) data collection sensors (3) light pollution reduction technology (4) geofencing and beacon technology (5) municipal wireless (6) electric vehicle charging stations. Each of the six activities is described in terms of existing prototypes and initiatives, its relevance to any of the four strategic development frameworks, procurement and implementation activities, and finally the associated operations & maintenance, and monitoring & reporting. At each stage, community engagement strategies and options are listed.

Pg. 28 Nacka, Sweden

A park lit by smart street lighting.

Pg. 33 Image

Statue of a musk ox outside of Yellowknife's City Hall.

Pg. 34 Case study

Mon & Nyord park at night.

Pg. 38 Graphic

A three-dimensional depiction of the connectivity between smart lampposts in a typical neighbourhood.

Pg. 39 Sensor technology

A list of potential sensor technology that could be implemented in tandem with the installation of smart street lighting. This list includes 12 applications for smart sensors: (1) Temperature, humidity, and CO2 climatic data monitoring (2) parking occupancy, vehicle detection in parking spaces (3) level displacement, measuring distance to objects to sense snowfall or ice on road (4) multi-purpose push buttons linked to different functions like satisfaction surveys, panic buttons, and light controls (4) motion detection sensors to monitor people, objects within a 4 meter radius for dimmable lighting control and pedestrian safety (6) noise meter to detect noise levels (7) light pollution meter to measure brightness of the night sky (8) water leak detection in pipe conduits (9) waste bin detection sensor technology that alerts the city when bins are full (9) meter reading to monitor consumption of electricity, gas, and for disfunction detection (10) permafrost temperature measurement and (12) water/sewer levels for more efficient trucked water delivery.

Pg. 40 Map

A map of the city of Yellowknife indicating locations of trucked water (areas highlighted in blue), for potential implementation of water level sensors.

Pg. 41 Map

A map of Yellowknife showing locations identified for potential electric vehicle charging stations.

Pg. 42 Map

A map of the city of Yellowknife that locates the current and proposed areas for municipal wireless.

Pg. 42 Case study

Neighborhood in Trondheim, Norway.

Pg. 44 Circle of Influence

An organigramme that depicts the various organizations and individuals who played a role in the development of this project proposal and their relationships to one another. Infrastructure Canada is identified as the enabling partner, Carleton University as the research partner, the Northland Utilities as the service provider, White Arkitekter as the knowledge exchange partner, and the YKDFN, Ecology North, Arctic Energy Alliance, GNWT, Goyatiek Language Society, and the general public as additional partners.

Pg. 47 Image

View of Yellowknife in the summer showing Old Town and Great Slave Lake.

Pg. 48 Image

Yellowknife at night as seen from Great Slave Lake.

Pg. 51 Image

Participants collaborating on identifying relevant Sustainable Development Goals at the design charrette in August 2018.

Pg. 52 Image

Community collaboration during the design charrette

Pg. 55 Image

Community collaboration during the design charrette

Pg. 56 Still

Still from Cabin Radio's livestream of the lighting prototype event in 2018

Pg. 59 Image

Tourists standing outside a teepee viewing the Northern Lights at Aurora Village.

Pg. 63 Image

Snowmobiles on Great Slave Lake at sunset.

From: SC / VI (INFC)
Sent: March 7, 2019 12:02 PM
To: Michael Auge
Subject: RE: Final Proposal - City of Yellowknife - Additional Privacy Information

Received – thank you.

Smart Cities Challenge Team
Infrastructure Canada
infsc-vi.infc@canada.ca

From: Michael Auge [<mailto:mauge@yellowknife.ca>]
Sent: March 6, 2019 5:14 PM
To: SC / VI (INFC) <infsc-vi.infc@canada.ca>
Cc: Hwang, Susan (INFC) <susan.hwang@canada.ca>
Subject: Final Proposal - City of Yellowknife - Additional Privacy Information

Hello,
Please see the attached letter from the Privacy Commissioner that I received in the mail today (I don't know what happen to the email version as it never came to me). Please add this to our Smart Cities Final Proposal privacy information section.

Thank you,

Mike Auge, P. Eng.
Manager, Sustainability and Solid Waste
Public Works and Engineering
City of Yellowknife
T: 867.669.3404
yellowknife.ca



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OFFICE OF THE
INFORMATION
AND PRIVACY
COMMISSIONER
NORTHWEST TERRITORIES

P.O. Box 382
Yellowknife, NT
X1A 2N3

February 14, 2019

EMAILED
February 14/19

City of Yellowknife
P.O. Box 580
Yellowknife, NT
X1A 2N4

Attention: Mike Auge
Manager, Sustainability and Solid Waste

Dear Sir:

Re: Smart City Challenge - Privacy Impact Assessment

Thank you for your email of February 12th as a follow up to our meeting on December 19th. During that meeting we explored the general intent and scope of your submission to the Smart Cities Challenge project. As I understand it, the first and primary focus of your project is about conservation and the collection of non-personal data to assist and support conservation measures and planning functions of the City. You also indicated, however, that future add-ons to the project may require the collection of personal information for various purposes.

Assuming that the data collection contemplated in the first phase of the project does not involve the use of cameras, I am satisfied that this phase of the project would not include the collection, use or disclosure of personal information and that, as a result, a preliminary privacy impact assessment would not be required.

We also, however, discussed future intentions for expanding the functionalities of the smart lampposts into areas that might well require the collection, use and disclosure of personal information, including the implementation of free wifi functions and vehicle charging stations for electric cars and perhaps some use of cameras for monitoring purposes. I encourage you to commit, in your proposal, to a full privacy impact assessment for any such add-ons in the future and that you incorporate "privacy-by-design" in any such additions.


In Yellowknife: (867) 669-0976 · Toll-Free: (888) 521-7088 · Fax: (867) 920-2511 · E-mail: admin@atipp-nt.ca

February 14, 2019

Page 2

I look forward to continuing to work with you as you complete your final submissions and implement your plans going forward. If there is anything further I can do to help, please feel free to contact me at your convenience.

Yours truly


Elaine Keenan Bengts
Information and Privacy Commissioner
/kb

c.c. Sheila Bassi-Kellett, City Administrator

Michael Auge

From: Michael Auge
Sent: February-12-19 8:59 AM
To: 'admin@atipp-nt.ca'
Cc: Sheila Bassi-Kellett
Subject: FW: Smart City Challenge - PIA
Attachments: image002.wmz; Letter to Mayor Rebecca Alty.pdf

Hello,

I'm following up on the meeting that the City of Yellowknife had with the Privacy Commissioner on December 19th, 2018 regarding our Smart Cities Challenge project. At that meeting we discussed the project and the privacy concerns that we'd need to be aware of moving forward and we were all in agreement that at this point, a full PIA is not required for this project. However, Infrastructure Canada requires that our final proposal include, "evidence that you consulted your relevant privacy authority and their guidance was considered."

In order to meet this requirement, I'm hoping that the Privacy Commissioner can provide us with a letter indicating that we have met with her and agree that a full PIA is not required at this time but that we will be working with the Office of the Information & Privacy Commissioner on PIAs for the project moving forward if we are selected as the winner.

If you have any questions or concerns with this request, please let me know.

Thanks,

Mike Auge, P. Eng.
Manager, Sustainability and Solid Waste
Public Works and Engineering
City of Yellowknife
T: 867.669.3404
yellowknife.ca



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Please consider the environment before printing this e-mail and/or attachments.

From: Michael Auge
Sent: December-13-18 7:13 AM
To: 'admin@atipp-nt.ca'
Cc: Sheila Bassi-Kellett; Chris Greencorn
Subject: FW: Smart City Challenge - PIA

Hello,

Thank you for letter outlining your Privacy concerns surrounding our Smart Cities Challenge project. I am the project lead for the Smart Cities project for the City of Yellowknife and I believe it would be a good idea for us to have a meeting with yourselves regarding these concerns and the best options for moving forward with our final challenge submission with regards to addressing the privacy issues that may be involved.

Would it be possible to arrange a meeting sometime next week with myself, Sheila Bassi-Kellett, and Chris Greencorn to discuss the project and the privacy issues involved? I can make arrangements to set up the meeting at City Hall if that works for you or we can come by your office if that is preferable. If this works for you and you'd like me to set it up, please let me know dates and times that would be preferable for the meeting.

Thanks,

Mike Auge, P. Eng.
Manager, Sustainability and Solid Waste
Public Works and Engineering
City of Yellowknife
T: 867.669.3404
yellowknife.ca



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Please consider the environment before printing this e-mail and/or attachments.

From: ATIPP Office - NT [<mailto:admin@atipp-nt.ca>]
Sent: Monday, December 10, 2018 10:08 AM
To: mayor@yellowknife.ca
Cc: Admin; Sheila Bassi-Kellett
Subject: Smart City Challenge - PIA

Good morning,

Attached please find a scanned copy of correspondence from the Information and Privacy Commissioner of the NWT. The original will follow via Canada Post.

Regards

Mársı | Kinanāskomitin | Thank you | Merci | Hą́ | Quana | Qujannamiik | Quyanainni | Máhsı | Máhsı | Mahsi

Lisa (Lee) Phypers
Office Manager | Gestionnaire de bureau
The Independent Statutory Offices | Bureaux des titulaires de charges publiques indépendants

NWT - Office of the Information & Privacy Commissioner
TNO - Bureau du commissariat à l'information et à la protection de la vie privée



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**OFFICE OF THE
INFORMATION
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NORTHWEST TERRITORIES

P.O. Box 382
Yellowknife, NT
X1A 2N3

December 7, 2018

Mayor Rebecca Alty
City of Yellowknife
P.O. Box 580
Yellowknife, NT
X1A 2N4

Dear Mayor Alty

Re: Smart City Challenge - Privacy Impact Assessment

Thank you for your letter of November 27th and information in relation to the Smart Cities Challenge.

The privacy impact of new technology is not always obvious. While most of the proposed uses of the "smart lamppost" project do not involve the collection, use and disclosure of personal information, there are some aspects of the project that suggest the technology may require such collection, use or disclosure. Based only on the information provided in your letter, for example, I see at least three potential areas in which the City of Yellowknife may be collecting personal information with its "smart" lampposts:

1. While it is not clear what kind of technology is intended to collect data about street conditions, traffic and pedestrian counts, if the use of cameras is anticipated, there will be collection of personal information in the form of images of those who come within camera range;
2. Unless the city plans to allow for electric vehicle charging stations free of charge, there will have to be a way for users to purchase the service. If this is anticipated to be accomplished on a "cash only" basis, there are no privacy issues. However, if it is intended to allow payment for services either through an app or by means of credit card, once again, there will be a collection, use and potential disclosure of personal information;
3. Whether or not wifi offered via these smart lampposts is free, when individuals use the service, there will likely be an attendant collection of device information which can, in turn, be fairly easily used to identify the device owner. IP addresses have been held to be personal information under access and privacy legislation throughout the country.

The purpose of a privacy impact assessment is to identify the potential for the collection, use and disclosure of personal information and to ensure that, if that

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December 7, 2018

Page 2

potential exists, there are appropriate safeguards and security measures in place to reduce those possibilities. It may well be that none of the proposed services will raise privacy concerns. A privacy impact assessment would confirm that.

Should you wish to discuss matters further, I would be happy to meet with you and/or the team preparing the proposal at any time either before or after the Christmas break.

Yours truly

Elaine Keenan Bengts
Information and Privacy Commissioner
/kb

c.c. Sheila Bassi-Kellet, City Administrator



CITY OF YELLOWKNIFE
OFFICE OF THE MAYOR

November 27, 2018

Office of the Information and Privacy Commissioner
PO Box 382
Yellowknife, NT X1A 2N3

Attention: Ms. Elaine Keenan Bengts

Dear Ms. Keenan Bengts,

RE: Smart Cities Challenge – Privacy Impact Assessment

Thank you very much for your letter dated October 31, 2018, and for your offer to assist the City of Yellowknife in our final proposal preparation for the Smart Cities Challenge (SCC).

In 2018, under the direction of Council Motion #0126-18, the City submitted a proposal for Infrastructure Canada's Smart Cities Challenge. The SCC is a competition open to all municipalities across Canada with the challenge to address local issues their residents face using a smart cities approach. The Smart Cities approach endeavors to achieve meaningful outcomes for residents through the use of data and connected technology.

City Administration partnered with Ecology North and Northland Utilities to form the SCC Team (the Team) which submitted an initial proposal in April 2018. On June 1, 2018, it was announced that Yellowknife had been chosen as one of twenty finalists out of over 200 applicants and one of five finalists in the under 30,000 population category. Being selected as a finalist meant that the City of Yellowknife would receive \$250,000 for the development of a final Smart Cities Proposal that is due on March 5, 2019. The grand prize winner of this category will receive a \$5,000,000 prize to be used to implement the ideas and projects that are included in the final proposal.

The central idea behind the project is to transform the lamppost into a beacon for sustainability. This will be accomplished by using the lamppost as much more than just a source of light. Several ideas have been developed around this concept including:

- Adjustable, motion sensing lights that can dim when no one is around;
- A data collection network that can automatically collect a variety of data including street conditions, traffic and pedestrian counts, energy use, and much more;
- Electric Vehicle charging stations;
- Tourism information and assistance;

WWW.YELLOWKNIFE.CA | YELLOWKNIFE CITY HALL | 4807 52ND STREET | BOX 580 | YELLOWKNIFE, NT | X1A 2N4 | (867) 920-5600

- Cultural and heritage displays; and
- Wi-Fi hotspots.

The overall vision is to include these technologies in lampposts throughout the City of Yellowknife in an effort to improve the social, environmental, and economic well-being of our citizens and our visitors.

A link to the initial proposal can be found on the City's website:

<https://www.yellowknife.ca/en/discovering-yellowknife/smart-cities.asp>

The SCC Finalist Guide states, "The Smart Cities Challenge final proposals need to demonstrate the inclusion of measures to protect personal information and privacy, and should respect the fair information principles." Furthermore, page 27 of the SCC Finalist Guide states, "If you determine that your project will involve the collection, use or disclosure of personal information or personal health information, you must complete a Preliminary Privacy Impact Assessment (PIA)."

To date, the ideas put forth in our proposal do not collect data about an "identifiable individual" but general data collection around dimmable lights, energy use, traffic counts, garbage sensors, to name a few. Based on the data collection envisioned, and what is classified as personal information, we believe that a PIA is not necessary at this time. However, the City of Yellowknife would like to consult with the OIPC to ensure the appropriate steps towards privacy are being considered.

Please find the attached SCC Finalist Guide for information. City Staff will arrange a preliminary meeting to discuss the project and the path forward.

Sincerely,

Rebecca Alty
Mayor
City of Yellowknife

Enclosure(s): Smart Cities Finalist Guide (DM#532416)
OIPC – Letter, Oct 31, 2018 (DM#536121)

cc: Sheila Bassi-Kellett, City Administrator

(DM#540786)





**OFFICE OF THE
INFORMATION
AND PRIVACY
COMMISSIONER**
NORTHWEST TERRITORIES

P.O. Box 382
Yellowknife, NT
X1A 2N3

October 31, 2018

Mayor Mark Heyck
City of Yellowknife
P.O. Box 580
Yellowknife, NT
X1A 2N4

Dear Mayor Heyck

Re: Smart City Challenge - Privacy Impact Assessment

Congratulations to the City of Yellowknife on being selected as a Smart Cities Challenge finalist. Your initiative to transform the simple lamp post into a tool for sustainability is interesting. I look forward to learning more about your project.

My office oversees the Northwest Territories' privacy laws that establish rules for public institutions and health care providers. We have been engaged on the Smart Cities competition, providing advice to Infrastructure Canada about the privacy risks of smart city initiatives.

I understand that Infrastructure Canada has required finalists to complete a Privacy Impact Assessment and to consult with the jurisdiction's provincial/ territorial privacy regulator to ensure that privacy considerations are given due attention. I am writing to initiate contact and to encourage engagement with our office as soon as possible to begin discussion on possible privacy issues and ensure they are successfully addressed.

I note that your final submissions are due on March 5, 2019. I want to be able to provide the best and most thorough advice that I can to help your project to be the successful one. In order to provide you with my input on your privacy impact assessment I will need at least four weeks to review your PIA and provide my comments and suggestions. I would, therefore, encourage you to submit the PIA to my office as early as possible and, in any event before the beginning of February.

I look forward to working with you to help ensure the success of your proposal.

Yours truly

Elaine Keenan Bengts
Information and Privacy Commissioner

In Yellowknife: (867) 669-0976 · Toll-Free (888) 521 7088 · Fax (867) 920 2511 · E-mail admin@atipp-nt.ca

Frederickton
(as reviewed)

FEB 18 2019

From: SC / VI (INFC)
Sent: March 7, 2019 12:00 PM
To: Bell, Adam
Subject: Smart Cities Challenge - Successful Final Proposal Submission

Dear Adam,

Congratulations! Your submission is ready to move onto evaluation following a completeness check (per the latest FAQs).

Thank you for your cooperation, patience, and hard work, especially during the past eight months. We are truly honoured to have worked with you and wish you the best of luck in the competition!

On a related matter, we have recently determined that it will not be feasible to post final proposals on the Infrastructure Canada website in a timely manner. Instead, we will take an approach similar to the application stage and publish your executive summary in both official languages on the Infrastructure Canada website with a link to the final proposal on your website. We understand that posting the final proposal on your website is not a requirement contained in the finalist guide so we appreciate your cooperation in facilitating access to your final proposal in an open and transparent way. Please note that the accessibility materials you have prepared for your final proposal will still be helpful in preparing various communications products to promote and share knowledge of your work.

Once you have posted your final proposal on your website, please send us the link if you haven't done so already. If you anticipate that you will be unable to post your final proposal on your website within two weeks, please let us know.

As always, we are happy to answer any questions. The best way to reach us going forward would be at our generic account: infc.sc-vi.infc@canada.ca.

Thank you.

Smart Cities Challenge Team
Infrastructure Canada
infc.sc-vi.infc@canada.ca

COMPLETE CHECK FOR FINAL PROPOSAL

FINALIST: Fredericton and Saint Mary's First Nation				
ASSESSED BY: Susan Hwang				
VALIDATED BY: Alex Long				
APPROVAL BY: Eric Poirier				
DATE OF COMPLETION: March 4, 2019				
REQUIREMENTS	COMPLETED	IF NOT COMPLETED, NOTE REASON	GUIDING PRINCIPLES	ACTIONS
SUBMISSION				
Submitted to infc.sc-vi.infc@canada.ca by 23:59 PST on March 5, 2019	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> No extensions will be granted No exceptions will be made for lateness or technical problems (finalist must be able to show evidence of submission) 	<ul style="list-style-type: none"> # to contact finalist If not resolved, # to flag to DG for decision
Final proposal is submitted	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> No extensions will be granted There is flexibility on the finalist video until the end of the week 	<ul style="list-style-type: none"> Assessor to save everything in designated folders # to contact finalist if anything is missing If not resolved, # to flag to DG for decision
Finalist video is submitted	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> There is flexibility on the finalist video until the end of the week 	<ul style="list-style-type: none"> Assessor to save everything in designated folders # to contact finalist if anything is missing If not resolved, # to flag to DG for decision
Preliminary Privacy Impact Assessment or Preliminary Rationale Analysis	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> No extensions will be granted 	<ul style="list-style-type: none"> Assessor to save everything in designated folders # to contact finalist if anything is missing If not resolved, # to flag to DG for decision
FINAL PROPOSAL				
Written in one of Canada's official languages	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> If the final proposal is submitted in a language other than English or French, a companion version in English or French is required from the finalist 	<ul style="list-style-type: none"> # to extract the executive summary from the final proposal and send it to translation (if a French final proposal, send the entire document to translation)
Generally readable (e.g. picture is not covering text, text are not overlapping)	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> If there are serious formatting issues that hinders readability, the finalist may need to resubmit 	<ul style="list-style-type: none"> # to do a scan of the final proposal and verify that all text and tables, graph, etc. could be read
Text-based and in either MS Word (.doc or .docx) or a fully readable, searchable, and selectable PDF (.pdf) format	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> Finalist may adjust the format for INFC posting purposes after the deadline 	<ul style="list-style-type: none"> # to verify with Comms if format is suitable for posting, given INFC web accessibility standards If not suitable, # to contact finalist
No longer than 75 pages* (Financial chapter exempted) and in 12 point font	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> Finalist cannot adjust content after the deadline If the text overall is smaller than 12 point font, INFC will adjust and evaluate within the new page count 	<ul style="list-style-type: none"> # to notify finalist if final proposal is over 75 pages # to notify finalist if INFC had to adjust the font and page count

DRAFT FOR APPROVAL

Contains an executive summary	<input checked="" type="checkbox"/>			<ul style="list-style-type: none"> # to QC and save translated version into the designated folder
Organized by these distinct chapters (not limited to these; not necessarily in the same order): <ul style="list-style-type: none"> Vision Performance measurement Project management Technology Governance Engagement Data and privacy Financial Implementation phase requirements 	<input checked="" type="checkbox"/>	<i>Also make a note of other chapters, if any</i>	<ul style="list-style-type: none"> Finalist must have these chapters Finalist can have more chapters Finalist can change the order of the chapters 	<ul style="list-style-type: none"> If the chapters are not clearly labeled, # to do a light analysis of where the content may be and make a note for the Jury
FINALIST VIDEO				
No longer than five minutes	<input checked="" type="checkbox"/>	11 seconds over (deemed to be within acceptable range)	<ul style="list-style-type: none"> Finalist may cut down the time for INFC posting purposes after the deadline 	<ul style="list-style-type: none"> # to notify finalist if video is longer than five minutes and needs cutting down
Submitted as a file or in a downloadable format	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> Finalist may adjust the format for INFC posting purposes after the deadline 	<ul style="list-style-type: none"> # to verify with Comms if format is suitable for posting, given INFC web accessibility standards If not suitable, # to contact finalist
CONFIDENTIAL ANNEX (OPTIONAL)				
Submitted if and only if required	<input type="checkbox"/>	N/A		<ul style="list-style-type: none"> # to flag with DG if confidential annex is lengthy

From: Bell, Adam <Adam.Bell@Fredericton.ca>
Sent: March 4, 2019 2:43 PM
To: SC / VI (INFC)
Subject: Final Proposal - City of Fredericton and Saint Mary's First Nation 1 of 6
Attachments: Fredericton and St Mary's First Nation Smart Cities Proposal March 2019.docx

Please find attached City of Fredericton and Saint Mary's First Nation final proposal

This email is one of six that includes the following

1. **Final proposal**
2. Letters of Support
3. Finalist Video link to download video
4. Preliminary Privacy Impact Assessment
5. Response from the Office of the Integrity Commissioner
6. Long text descriptions for accessibility requirements and transcripts

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"Partnering with others to support our organization in making Fredericton the best place to live, work and play."

www.Fredericton.ca

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Smart Cities Challenge

City of Fredericton & St. Mary's First Nation

March 2019

Fredericton



A City to Like, Share and Follow

A poem written for the City of Fredericton & St. Mary's First Nation joint Smart Cities initiative (read at the joint Council briefing on January 30, 2019)

On the bus ride home, I watch a video of a Fredericton 5th grader who used her allowance to buy coffeeshop gift cards for the homeless in her neighbourhood. It's been a Shakespearean winter for those living rough, one of discontent and thin tents— a child can see that. I want a city as compassionate as that 10-year-old, chatting with strangers outside the community kitchen like she's with old friends; a city as warm as the hand-knit scarves tied around street poles and fences alongside the water treatment plant for those in need of heat, of comfort. I want a city that recognizes me in the same way that the vendors at the Boyce Farmer's Market do on a busy Saturday morning, knowing my name and what I do for a living, that the Guinness aged cheddar I buy pairs well with the sweet apple cider from the next stall over, that I live around the block and it's a short walk. I want a city that's a friend and an ally to St. Mary's First Nation; a city that connects with its residents like the Bill Thorpe marries the North and South sides. I want a city old as the Wolastoq River and as current so fewer friends leave to go out west and instead take root, I want to retain our youth. I want a city as smart as its population, as its university town reputation: UNB and STU, NBCC and the College of Craft and Design nourishing artists and scholars, blue-collars and doctors. I want a city that's accessible, easily navigable, multilingual, a city that is a home, a safe-haven, a welcome wagon. I want a city that's tech-savvy and customizable, a city to like, share, and follow.

Written by Jenna Lyn Albert, Poet Laureate for City of Fredericton

City of Fredericton & St. Mary's First Nation Partnership



St. Mary's First Nation Band Council and Fredericton City Council at their joint gathering on January 30, 2019.

Executive Summary

Our original **Challenge Statement** that we created for our application is:

My city does not recognize me or connect me to what matters most; Fredericton will collaborate with First Nations to create an accessible, welcoming, supportive city for youth, newcomers, and an aging population, empowering everyone with a Personalized Inclusion Plan that connects people to create an exceptional quality of life.

Over the course of the finalist phase, we engaged further with stakeholder and residents, tested out concepts and ideas, and refined our **Vision** for our Smart Cities Proposal:

Fredericton & St. Mary's First Nation are collaborating to create an accessible, welcoming, supportive community, starting with youth, newcomers, older adults, and persons with mobility-related disabilities; recognizing what is important to individuals and connecting them to what matters most, empowering residents with personalized digital tools, data & technology that enable them to create an exceptional quality of life.

To achieve this vision, we're proposing to carry forward the main initiatives that we set out in our original application, including the **Digital Fredericton** transformation initiative, the **Digital Community Hub** (formerly Smart City Dashboard/Real-Time Census), as well as three other community initiatives: **Doorable**, **Non-Profit Data Collaboration**, and **Road Home Digital Platform and Enablement**.

The initiatives we're proposing will offer more meaningful ways for community **Engagement**. We're using human-centred design to involve residents throughout the process of designing solutions, tailoring them to their unique needs. We've developed a unique model to discover who our residents are, gain deep insights about their aspirations and challenges, generate ideas for solutions, and co-create and test solutions with the community. We've piloted this approach with the key initiatives during the finalist phase, which generated key insights guiding this proposal and leading to the creation of four prototypes. We've also widely and deeply engaged community stakeholders throughout our Smart Cities Journey, developing partnerships and working relationships to deliver the initiatives in this proposal.

We've scoped out each of the key initiatives in **Project Management**, defining the goals and deliverables and resource requirements, while using an overall, coordinated approach for procurement, communications, risk management, and monitoring/managing issues.

We built our **Performance Measurement** plan across three strategic areas, aiming ultimately to achieve our vision to through three long-term outcomes:

- Developing a detailed community profile with richly defined segments and needs.
- Providing more efficient and targeted services that address needs, working in an end-to-end environment that puts resident engagement first.

- Connecting people to what matters, increasing inclusion through the uptake of personalized digital tools.

We've developed the deliverables and performance milestones that will trigger progress payments of the prize money. We've also outlined an approach to monitor, report and evaluate progress on performance at monthly and quarterly intervals

We have crafted a **Technology** architecture to achieve these outcomes, creating new user experiences and rich data sets and augmenting the workforce. We've designed the architecture across layers – from sensors and edge devices through to smart algorithms. Our technology selections are guided by principles to ensure interoperability, extensibility, scalability and replicability to achieve and sustain our technology vision. The technology architecture will be able to respond to rapidly changing technology environments. The proof of our technology is in the prototypes. We've demonstrated all layers of the technology architecture in action to provide sharply tailored personalized experiences using connected technology and data.

In terms of **Governance**, our Fredericton Smart Cities Task Force will oversee the implementation of our Smart Cities proposal. The Task Force includes representatives from City of Fredericton, St. Mary's First Nation, committee leads for the main initiatives and as well as stakeholders to provide academic, commercial and social oversight. The City and St. Mary's also intend to enter into a Friendship Accord, which will build on the governance structure to offer a framework for continued collaboration on this and other broader community issues of mutual interest. We have plans for program administration and implementation and have developed a number of partnerships with stakeholders to deliver our proposal outcomes.

We went through an intensive process to develop a plan for **Data and Privacy**, particularly as it relates to protecting personal information. We've completed a PPIA that examined each of the main initiatives in our proposal and outlines the risks related to privacy and planned measures to minimize those risks and comply with privacy legislation and standards. We've summarized those risks and plans to protect data and privacy in this proposal.

To meet the **Implementation Phase Requirements**, we've outlined the approach that we will use for consultation between St. Mary's First Nation and City of Fredericton, as well as our intention to provide employment and/or procurement opportunities for youth/ Indigenous peoples, small-to-medium-sized social enterprises, and women under the Community Employment Benefits initiative.

As part of the **Financial** plan, leveraging other sources of revenues and investment to increase the impact of the initiatives, including investments from the City of Fredericton, its wholly-owned subsidiary e-Novations Comnet Inc., and in-kind investments from technology partners. We used similar experiences, industry standards, estimates from vendors for specific items, agile development, and detailed cost breakdowns of project subcomponents to estimate costs and minimize finance risk.

Vision

"Not everyone has the same needs & wants – but everyone has needs and wants."

City of Fredericton Mayor Mike O'Brien

"Everyone matters. The City of Fredericton and St. Mary's First Nation are thinking outside the box so that we can develop and plan for today, tomorrow and the future."

St. Mary's First Nation Chief Alan Polchies Jr.

Imagine a *Smart City* where all residents are recognized and connected to digital services and resources they need 24/7 on a personal, interactive level.

Imagine an *Accessible City* where there are no barriers, doors wirelessly open, and you can easily find available, wheelchair accessible parking.

Imagine an *Inclusive City* where no one is left behind, and the most vulnerable are digitally enabled and expedited on a path for sustainable living.

Imagine a *Digital City* where free WiFi and open data access fuels new startups – enabling residents to create networks and design solutions addressing community problems.

Imagine a *Caring City* where non-profit organizations in the community are connected to provincial and municipal data infrastructure to influence policy development and drive evidence-based decision-making to improve the lives of residents.

Our Smart Community Vision

Fredericton & St. Mary's First Nation are collaborating to create an accessible, welcoming, supportive community, starting with youth, newcomers, older adults, and persons with mobility-related disabilities; recognizing what is important to individuals and connecting them to what matters most, empowering residents with personalized digital tools, data & technology that enable them to create an exceptional quality of life.

A Look Back at Our Smart Cities Journey

When the Smart Cities Challenge was first issued in November 2017, Fredericton set out to determine through wide-ranging engagement what the biggest challenge facing our community was and how we could solve it using data and technology. Through an extensive engagement process, we received hundreds of responses from the public through surveys (online and in paper copy), with a game app, using social media and emails to networks of community stakeholders.

What we found was that people had an incredible wide range of issues and solutions in mind. While we found the biggest issue facing the community is different for each person,

the commonality is that everyone has desires and needs that could be better met. People expressed a desire for the City to better understand the needs of residents through improved data and targeted services to individuals based on their needs.

We saw a unique and historic opportunity for St. Mary's First Nation and Fredericton to partner together in this ambitious and important endeavour. **Both communities remain committed to work together to develop innovative solutions** to issues we share as well as the issues that are unique to our communities. We consider this the launching point for a future Friendship Accord.

We collaborated and consulted deeply with the community to create our application and our proposal through our Smart City Task Force and its committees. More than **40 people from 20+ organizations** have been directly involved during the finalist phase in creating this proposal and moving forward its key initiatives, with additional stakeholders being engaged through individual projects. **Residents have also been directly involved in the design and creation of the solutions proposed** through the use of deep one-on-one conversations and observation, online survey responses, user-centred design workshops and focus groups, and testing the prototypes. (See *Engagement* for more detail.)

Before we entered the Smart Cities Challenge, we held a number of broader community engagement efforts that, together with the engagement efforts we undertook in the application and finalist phases, have helped inform our proposal:

- **Imagine Fredericton** – involving 2,800 people over 85 days to articulate the vision for the City as it grows, including the importance of being a welcoming and supportive community.
- **Digital Fredericton** – engaging more than 120 staff from across the City of Fredericton at every level on how the City can improve operations for better service.
- **Partnering for Impact** – 72 people from 30+ non-profit organizations coming together, identifying that to collaborate on shared concerns, there is a need to enable data collection, collaboration and measurement in the non-profit sector.
- **Age-Friendly Survey** – more than 900 older adult survey respondents identifying what they like about the community and what could be improved to make it more welcoming and safer for older adults.
- **Open Space Forum on Homelessness** – involving 40+ faith-based groups, highlighting the need to better coordinate efforts of these groups for those experiencing poverty and/or homelessness.
- **The Road Home: A Plan to End Homelessness** – consulting more than 130 community stakeholders including frontline workers at homeless serving agencies and people who have lived experience with homelessness, identifying that shared data management is a key feature to better serving people who experience homelessness in the community.

One of the key insights we had in the lead up to our original application was that **we could not be a smart community if we left behind the people that are most likely to be under-engaged – those who often experience vulnerability, marginalization or exclusion**. We decided that a smart community respects, values and facilitates the contributions and talents of all residents and accepts and embraces our diversity.

We created our challenge statement to focus on community collaboration to create a welcoming, supportive and accessible community for all by recognizing and connecting people to what matters most to them. We set a bold aspiration in our application for the **primary outcome** we wanted to achieve – to identify citizens' unique needs, connect them to personalized services and resources that meet those needs using enhanced data tools, and to develop new collaborations and partnerships to achieve it.

Connecting culturally is important for a sense of inclusion and belonging. For First Nations, language and culture are core to identity; reconnecting with customs and language are important in restoring a personal sense of inclusion and rebuilding national identity. **Applying a cultural lens to our digital tools will result in services that are both sensitive to these needs and direct in address them.**

"Our Smart Cities Challenge proposal addresses the issue of belonging. It's so important to foster communities where every citizen has the opportunity to belong; where barriers are broken down so that every person can access the benefits and advantages of their community. Working on this project has brought the community together and generated an awareness, sensitivity and motivation to design tools that enable and promote the inclusion of those who have not been adequately serviced and/or aware of services that exist. Through the Smart Cities Challenge, experts in every field are contributing their knowledge and skills to create a sense of belonging to make our city the best it can be for all its residents."

**Kate Rogers | Executive Director, Fredericton Community Foundation
City Councillor**

What we propose is a **fundamental shift away from community leaders and service providers needing to rely on assumptions** of what the needs and wants of the community are and how they serve them. This is a necessary shift.

For example, we saw through the Imagine Fredericton exercise in 2016-2017 that the city will change significantly over the next generation, with a likely 50% increase in population by 2041, largely growing through immigration (like the rest of Canada). This will massively increase demand for services. We've also seen over recent years that people expect immediate access to services – government services included – and that people expect services to be maintained, even improved, without necessarily paying more. We must have a continual pulse on who is in our community and be able to adapt to their needs and aspirations. This is also critical in terms of having talent to fuel our local businesses.

Looking Ahead – What We Propose

- We will create modern Smart City digital infrastructure that will enable us to recognize who is in our community and what is important to them, connect them to what matters most, and enable collaboration to create a welcoming, accessible, inclusive, supportive community. Our overall guiding approach to achieving this is to:

- **Understand our resident landscape and define aspirations for the desired experience** to enable the development of prototype solutions for service improvement.
- **Modernize and integrate core digital infrastructure** and systems to enable more efficient and targeted services and increased collaboration.
- **Connect aggregate and de-identified data** from a wide variety of sources to build a detailed community profile/census with richly defined segments and needs.
- **Develop more accessible digital tools and connected technologies that are personalized and support the inclusion of residents**, enabling people to connect more to what matters to them in the community.

Our proposal demonstrates the advancement of and continued focus on the initiatives that we proposed in the original application to recognize and connect people to what matters, including:

- the **Digital Fredericton** transformation initiative
- the **Digital Community Hub**
- Connected Community initiatives (**Doorable, Non-Profit Data Collaboration, and Road Home Digital Platform and Enablement**)

Digital Fredericton

At the **epicenter of our Smart City aspiration** is the need to completely change and modernize how the City operates, serves residents, and collaborates with community. The Digital Fredericton transformation initiative represents a five-year journey to become a more flexible, efficient, responsive, and transparent government that works with community partners and focuses on what matters most to residents. This means a focus on delivering experiences to residents instead of services, establishing new collaborative working relationships, and engaging with our community in new and meaningful ways. There are three key layers to make this happen in a structured and integrated way:

- **Layer One: Core Foundation**

(becoming a more efficient organization to better serve citizens)

This is about transforming how the City runs its business with standardized and efficient processes through modernizing systems and IT infrastructures and establishing metrics that matter. As the City gains efficiencies inside the organization, it will reallocate human talent to improve or extend citizen services. Putting these digital core systems in place will provide more accurate and detailed data that will bolster the City's human resources with new insights and data-driven knowledge. It orchestrates an augmented workforce that is both efficient and customer-focused.

- **Layer Two: E-Government**

(transforming services for citizens)

This work involves enabling better digital citizen experiences through easy, intuitive access to technology-enabled services that are available 24/7. It's about putting systems in place to better understand and communicate with residents and businesses in real-time to address priorities and needs to make more effective, more resident-centric decisions.

- **Layer Three: Connected Community**

(connecting community partners for innovation at the edge)

This involves working collaboratively with partners in our knowledge ecosystem to continue to enhance services through innovation, becoming a living lab for solutions. It means making data easily accessible, enabling online collaboration and participation from the public and community stakeholders to develop improvements in the community that will help citizens experience life in extraordinary ways.

The transformational work undertaken through Digital Fredericton will make it possible to have both the human and foundational digital infrastructure resources necessary to make possible the other initiatives we feature as part of our Smart Cities Challenge proposal.

Much work has begun with the Core Foundation over the past year, with implementation of key internal systems. To set the stage for the work to be undertaken as part of the implementation phase for this Smart Cities proposal, a Citizen Experience Strategy will be undertaken to define segments and understand the overall aspirations of the customer.

Digital Community Hub

In order to enable new community collaborations, innovation and to get a picture of our community, we propose creating a City of Fredericton and St. Mary's First Nation Digital Community Hub. Currently, information and data about what's available and happening in our communities and the people in them is extremely fragmented and siloed, collected by a wide range of government, academic, non-profit and business sources. How can we connect people to what matters if organizations and individuals don't have a unified, complete, evidence-based picture to understand what is available and where gaps are?

The Digital Community Hub will combine aggregate data from shared data platforms and disparate data systems to create a multi-level hub – creating rich, open data on and for our community, opportunities for unique collaborations on issues that matter to residents, as well as personalized access to what matters most to people. This hub will bring together both existing data and applications as well as new ones developed through the work described in this proposal. The goal is to create a seamless, integrated resident experience, tailored based on the needs and preferences of the individual.

Components of the Digital Community Hub

Smart City Dashboard

Allowing for transparent measurement of community performance based on established smart city indicators (e.g. livable community, mobility, safety, environmental stewardship)

Cause-Based Hubs

Enable organizations to contribute data and work with like-minded organizations on issues of community interest and evaluate the effectiveness of their work

Personal Digital Inclusion

Enabling individuals self-serve and personalized access to resources, tools, people and services they need in the areas that matter most to them

Resident Contribution

Enabling individuals to voice their need / report an issue and to contribute based on a community need (e.g. volunteer, develop an app, report a problem, add individual perspectives to community issues)

Connected Community Initiatives

Doorable (Developed by Appdigenous)

People with mobility-related accessibility challenges experience a number of barriers, even when something is purportedly designed for them. The existing “push buttons” on accessibility doors are often blocked, not functioning, awkwardly placed, or simply not easily used by people who have limited mobility in their arms and hands.

Doorable, developed by early-stage startup Appdigenous, is an Internet of Things solution featuring a multi-functional mobile app & custom designed hardware. It will help reduce barriers by wirelessly opening doors through a smartphone/tablet app. It will further help in identifying and reducing accessibility barriers by mapping the accessible city, creating a platform for app users to communicate directly with each other and facilities about accessibility barriers, and building data through interactions between citizens and infrastructure. The technology will integrate with the Digital Community Hub to help offer more robust information and data around accessibility and related challenges in our community. This project would make Fredericton and St. Mary's First Nation an early adopter test bed for the technology and a product development living lab for accessibility in Canada. Testing has already begun and is revealing insights on how the physical shape of our cities can profoundly hinder or enhance full participation in civic life. Appdigenous has, as part of this process, already developed concrete plans to expand into communities across the province and country with this next generation technology.

Non-Profit Data Collaboration

Many non-profit organizations (NPOs) lack expertise in data-driven outcome evaluation and measurement and miss out on the benefit of using data to best inform the decisions and policies they make. Government departments across Canada do not have robust access to data related to the frontline services of non-profits, which is a huge gap in information for policy development. NPOs want to go beyond siloed agency-specific data and be able to compare and link their data to other open data sources to gain a more holistic understanding of the impact of the services they provide on community.

Through this project, we will build the NPO community's capacity to collect data, establish measures and integrate with other public data. It will involve working with NPOs on establishing meaningful measurements, standardizing how to collect data, and how to link it with other data that is available to be able to measure efficiency and impact, improve access to funding, identify gaps and improve services. This project will allow agencies to collaborate and access data at a community level through the Digital Community Hub in cause-based hubs. Secondly, through the New Brunswick Institute of Research, Data and Training (NB-IRDT), one of the most secure data centres in Canada, it will allow government, non-profits, and researchers to secure aggregate/anonymous data on the impact of their services which can be cross-referenced with community demographics. You can see more about the process of how data is shared through NB-IRDT in this video:

<https://www.youtube.com/watch?v=vUrkcUyFunM>

Road Home Digital Platform & Digital Enablement

Our homeless serving agencies are continually dealing with resource constraints to help their clients move along the continuum of care to achieve stable housing. These agencies lack the technology most organizations take for granted to operate efficiently and effectively. Clients often have to tell their story multiple times when they present themselves at homeless serving agencies that can and do work together to help them.

Adopting a shared digital platform through HIFIS4 (the latest version of the federal government's Homeless Individuals and Families Information System) will allow for shared case management and provide agencies with quick, accurate information to help better support clients, securely capture aggregate data, and generate useful reports to track performance and needs at an agency and community level. The plan is to expand HIFIS4 across the homeless-serving system to enable a coordinated approach to serving clients. For individuals, this system will reduce the need for them to re-tell their story to multiple service providers and help them connect to services along the continuum of care more effectively. To further enable this connection, we're also proposing to expand access to free, high-speed Internet in the shelters and in public places, as well as enhance and design new self-serve digital personalized inclusion resources for this segment as part of the Digital Community Hub.

Ongoing Development of Connected Community Applications

There are many more solutions that our focused iterative model will produce and refine. Connected Community applications will be based on the insights we gain from understanding residents more deeply and developing solutions to help recognize and connect them with what matters personally.

Through the finalist phase, we continued to uncover new opportunities using the model of dialogue with a segment to learn about the needs of people in that segment and then involving them in user-centred design to co-create a prototype. In one example, we partnered with a local startup to prototype an app for newcomers to connect them with a personalized tool designed to help facilitate their inclusion.

Our vision includes ongoing mutual learning about the data and technology opportunities within First Nations. This proposal recognizes Indigenous rights to self-determination. Under Indigenous control and directed by staff hired from Saint Mary's First Nation, the team will develop technologies and applications that match the aspirations of Indigenous people and are culturally sensitive to First Nations' needs.

Smart City Internet of Things (IoT) Telemetry

- Resident experiences can be personalized in real-time with data about the status of services that impact them.

Cities deliver many common services to residents using infrastructure, public spaces and assets that are spread across a large geographic area. Telemetry is an automated communications process by which measurements and data about infrastructure and public

services are collected at remote geographic or inaccessible points and transmitted to receiving equipment for monitoring.

Services can be optimized and personalized using real-time and historical data. Real-time data about the availability of a parking space, the status of a transit bus, the current river height during a flood, soil condition at sports fields after rain, air quality, noise level, current snow clearing and garbage routes and road conditions will be pushed from our LoRaWAN IoT network to our open data portal and accessible through application program interfaces (APIs) for consumption by Connected Community applications, third party developers, and internal City operations.

Our Repeatable Community Model

With the Digital Fredericton transformation initiative and Digital Community Hub providing the foundation, we have developed a repeatable community model to recognize and connect residents with what matters to create an accessible, welcoming and supportive community through the use of personalized digital tools and data, achieving the transformation we envision. First, to get an overall picture, we will undertake the Citizen Experience Strategy to identify and learn more about resident segments in our community. Once we have the overall experience defined, we will conduct in-depth learning on each segment and develop solutions in response to the unique needs and aspirations of residents. Below is an outline of the process (see *Engagement* for more details).

- We will **deeply get to know each segment** (beginning with those who are most likely to have experienced marginalization or exclusion) **and their experiences through direct interaction** using ethnography. Ethnography means having deep one-on-one conversations and interactions with people to understand day-to-day experiences of residents, what's important to them, and what barriers/challenges prevent them from having a great day in the community. We will supplement this approach with engagement through the resident contribution feature on the Digital Community Hub to confirm insights and offer broader opportunities for people to identify barriers they face to their quality of life.
- Based on the research, we will use **journey and empathy mapping** to develop insights about what matters to people in that segment. We also use the research to develop distinct "personas" within the segment (a resident profile that brings together specific types of similar experiences and behaviours within a segment).
- We will then engage and connect with community partners (e.g. NPOs, entrepreneurs, tech businesses, etc.) to **ideate potential solutions** based on the insights using connected data and technology.
- We will **co-design the solutions with residents** from the segment and work with community partners to **develop prototypes** of personalized digital tools, data and technology using user-centred design workshops.
- We will bring the applications and data from the developed tools and technology into the **Digital Community Hub**, which will feed back into the cycle by further giving us insight into the challenges and aspirations of our community. This will contribute to the

metrics that enable better policy and decision making and offer richer, personalized information tailored to each individual's unique set of needs and preferences.

This model isn't a straight line – it's an iterative cycle. We will continually go through the process of taking what we learn from each segment through the engagement, ideate on solutions, prototype, test and build more data and insights to improve on those ideas and develop new ones.

Outcomes

Through the initiatives we propose, we will achieve our **primary outcome** of identifying residents' unique needs and connecting them to personalized services and resources that meet those needs using enhanced data tools. We will do that through the following key related outcomes (see more detail in *Performance Measurement*).

- Improve the quality of life by making it easier for citizens to access all services provided by the City and for the City to push out information that is meaningful to citizens.
- Use customer relationship management (CRM) systems and move more staff to customer-facing roles to create a more personal, welcoming city, enabled by efficient, technology-driven processes.
- Create a multi-level hub to create a channel for interactive government, personalized access to services and activities available in the community, and a place where the community can collaborate on key quality of life issues, bringing together both traditional & non-traditional partners to deliver on common objectives.
- Increased economic vitality and job creation through the development of new technologies resulting in the creation of new startups and new opportunities for existing businesses, as well as increased participation of underrepresented groups in the job market due to increased accessibility and connection to needed supports.
- Recognizing that language and culture is identity and the importance of these for Indigenous people, enable an Indigenous cultural resurgence through digital technologies that youth and elders can use to connect with their language and heritage.

"Indigenous community members of all ages use digital technologies – in particular social media. A holistic approach to digital technology can support Indigenous language and cultural resurgence."

David Perley | Director of the Mi'kmaq-Wolastoqey Centre

"Language is identity. It's the foundation. This is the International Year of Indigenous Languages. We have a prime opportunity to remove barriers to learning our language."

Chief Alan Polchies Jr. | St. Mary's First Nation

- Empower the City's non-profit agencies to make data-based decisions that will help them to better serve their clients and our community and be able to contribute to the community-level data.

"Shared data within and from the non-profit community will enable a full conversation with all social sector stakeholders who are working with the most vulnerable members of our community day-in, day-out. The greatest benefit of this project will be how shared data enables government, business, and community partners to collaborate on the solutions to the most pressing problems facing our community. As a community, we are striving to achieve bold targets to address deeply entrenched social issues; without shared data, we cannot really know if our efforts are amounting to the change we desire, or why they may not be working. You can't manage what you don't measure. Data and results are essential in making sound social and public policy decisions, and so often we are limited to making important decisions based on hunches or anecdotes."

Jeff Richardson | Executive Director, United Way

- Enable a more accurate assessment of the housing and support needs of people experiencing homelessness in our community and reduce their need to tell their story multiple times through enabling shared case management and resource allocation between homeless-serving agencies.
- Making the physical infrastructure of the city more accessible, and movement through the public space more fluid, making it easier for people with mobility-related accessibility challenges to live and get around their community with fewer barriers.

"AbilityNB applauds the leadership of the City in seeking solutions to accessibility challenges with our City to ensure everyone can live work and play in our community. Universally designed communities and programs are essential so all residents of a community can actively participate. More than 73,000 New Brunswickers live with a mobility disability – the most common disability type in NB. At 26.7% of the population, New Brunswick has the second highest rate of disability in Canada. A disability lens on policy, infrastructure and program development is critical."

Haley Flaro | Executive Director, Ability NB

Progress Towards Outcomes During Finalist Phase

During the finalist phase, we focused on further developing this final proposal while also making significant progress towards these outcomes and testing our approach. Over six months, we put systems in place and tested out the ideas and concepts we're proposing, conducted research on some of our priority segments and accelerated the development of key prototypes of solutions for them.

Building core foundation	<ul style="list-style-type: none"> Engaging more than 120 City staff to select, test and configure technology tools to assist in streamlining business operations. Modernizing our approach to internal systems has driven results for staff and gained efficiencies that are being re-invested in delivering value to citizens. Built most of the City of Fredericton's core digital foundation through implementing an enterprise resource planning cloud solution (Canada's first cloud-based municipal core), enabling staff with modern technology and corporate standard processes to be more efficient in their operations. Freeing up staff capacity and reallocating staff toward customer-facing roles to improve services for citizens.
Uncovering insights on resident aspirations & challenges	<ul style="list-style-type: none"> Focusing on three of the priority segments – older adults, people experiencing accessibility challenges, and newcomers: <ul style="list-style-type: none"> One-on-one conversations with older adults to uncover insights that removed assumptions and highlighted opportunities to help older adults in our community. Co-design workshops with older adults and persons with mobility-related accessibility challenges for the Digital Community Hub. Conducting a day-in-the life tour with a person in a wheelchair to understand challenges. Broader online survey to uncover more about the barriers people with mobility-related accessibility challenges face with entering buildings and getting around the community. Conducting a co-design workshop and journey mapping with newcomers of diverse backgrounds. Conducting an environmental scan of NPO best practices of data privacy, use and collaboration.
Stakeholder relationship/ partnership development	<ul style="list-style-type: none"> Developing relationships and in-kind and other partnerships (see <i>Governance</i>). Building stronger relationships with other municipal governments and levels of government to ensure a repeatable model is designed for resident-centric communities. Onboarding 11 non-profits for the Non-Profit Data Collaboration, mapping out their current data collection, use and disclosure practices and privacy standards and delivering education on the benefits of data collaboration with other non-profits through a video and workshop. Onboarding 5 homeless-serving agencies for Road Home Digital Platform & Enablement, identifying the most meaningful outcomes achievable through digital enablement to help better serve those who experience homelessness and begin data transfer to HIFIS4 (shared digital platform). Engaging with the Mi'kmaq-Wolastoqey Centre to uncover potential ways to support Indigenous resurgence with digital technologies. Engaging with Mayor, Chief, City Council & Band Council on progress and goals of proposal.
Data and Privacy	<ul style="list-style-type: none"> Completing comprehensive preliminary privacy impact assessment (PIIA). Mapping out data flow for projects.

	<ul style="list-style-type: none"> Conducting extensive workshops with project leads, led by a privacy expert with more than 25 years of experience to create a detailed plan with clear principles to ensure all projects comply with legislation and meet the standards of Privacy by Design and the 10 Canadian Standards Association (CSA) Privacy Principles.
Ideating and Prototyping	<ul style="list-style-type: none"> Running an ideation workshop to generate and prioritize ideas for prototypes based on insights gained from older adult ethnographic research. Rapidly prototyping a check-in companion app (developed by a local startup) that can be used by older adults so they feel connected and safer in our community. Running the two co-design workshops with individuals that identified as older adults and persons with mobility-related accessibility challenges to identify the best design for the Digital Community Hub prototype. Creating a prototype of the Hub with a focus on mobility, accessibility, and older adults. Accelerating the development of the Doorable hardware and first version of app software. Developed Hullo app MVP (minimum viable product) for newcomers to connect with settlement organizations.
Testing Prototypes	<ul style="list-style-type: none"> Usability testing of Digital Community Hub, Hullo App, Companion Check-In, and Doorable (see <i>Engagement</i>)

Why This is a Winning Proposal

Our proposal thoroughly embodies a smart cities approach. We will bring together diverse sources of data to break down silos between government, organizations and residents so that we can address issues of importance to the community in a holistic way, with a complete picture of what matters and a more accurate measure of our performance in addressing the needs of our residents. It's about coming together as a community, bringing together partners and stakeholders – from the City and St. Mary's First Nation, to businesses, non-profit organizations, academia, and individuals – to collaborate in creating a more welcoming, accessible and supportive community. First by getting a more accurate and deep assessment of what the experiences, aspirations and challenges of our residents are, then developing innovative approaches to improve services and break down barriers to inclusion and full participation for all.

We have developed a unique approach to understand and better serve residents:

- using ethnography and a continuous dialogue with residents to gain a deep and ongoing understanding of our residents, their aspirations and challenges
- interconnecting data from a wide variety of disparate sources to build a complete community profile and enable effective analysis & insight-driven decision-making to make services more effective for residents
- intensely collaborating with community partners from all sectors
- involving residents directly in the design of solutions using human-centred design

- enabling a more personalized experience for each resident, tailoring services, information and tools to their unique needs and preferences

We have the momentum to make this proposal a success. The initiatives that we propose build on work that has been ongoing in the community. We have made further significant progress during the finalist phase – creating several prototypes in addition to creating this final proposal. **We have demonstrated our ability to make significant progress in a short amount of time and to make investment dollars go far.**

We have a demonstrated ability to build and implement smart solutions that will be a model for the country. As part of the Digital Fredericton transformation, the City of Fredericton has launched Canada's first cloud-hosted enterprise resource planning solution for a municipality, which was implemented using agile development in just eight months and was completed on time and within budget.

Other initiatives we are undertaking further demonstrate how we are able to lead the country in building smart communities. The Non-Profit Data Collaboration project is a game-changer, as it is the first time that NPOs are working together to collect and bring together data on their services on this scale, connecting them with provincial and municipal data infrastructure.

The Connected Community apps developed through the implementation of this proposal, such as Doorable, will be developed with the view of being adoptable by other communities across the country. We're also building technology that is enabling a likely unprecedented amount of collaboration among community partners of all types, as well as an ongoing dialogue with citizens.

The initiatives in this proposal will not only lead to an improvement in the quality of life for Fredericton and St. Mary's First Nation; the transformative solutions we develop will also be able to benefit communities of all sizes across the country. Any community will be able to replicate our approach to recognizing and connecting residents to what matters and building personalized digital tools that respond to their community needs.

Engagement

Engagement is the Cornerstone of Our Proposal

Traditional community engagement includes broadcasting information (through news releases, web and social media updates), public meetings and open-houses, online surveys, stakeholder meetings and emails, sometimes more unique activities like an “ideation bus”, etc. These methods of engagement are useful, but there are ways to more deeply and meaningfully engage with residents.

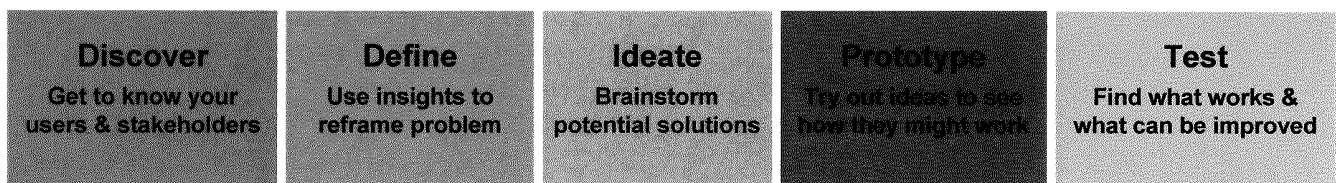
The initiatives and projects that are part of this proposal will offer ways for the City of Fredericton and St. Mary's First Nation, as well as other organizations within our communities, to engage with approaches and tools that put our residents at the center and allows for better understanding of their needs, desires and challenges. Residents will have an improved ability to voice their needs and contribute back to our community.

We are also deeply involving residents and stakeholders in the design of these solutions that we will use to be able to engage and better understand residents and connect them to services and resources that meet their unique needs.

Using Human-Centred Design

We're using human-centred design (or user-centred design) to involve the people we are designing for and facilitating citizen co-creation throughout our Smart Cities projects – from concept to design, implementation, and evaluation. This will ensure that the solutions are tailored and adjusted along the way to meet their needs and achieve meaningful outcomes.

Human-centred design informs better decision making by understanding not only what works or doesn't work, but also why. It allows us to more deeply understand the pain points and ambitions of the community's residents to be able to build the most effective and appropriate solutions to connect them with what matters. Here are the elements of the human-centred design process we're using:



Source: Jules Maitland, Human Centred R&D

The process doesn't end with testing the solution – there's a continuous loop as we brainstorm solutions for improvements based on feedback we get in the testing phase, prototype those improvements, and test them again with people. It's an iterative and ongoing cycle within a living lab environment.

It's easy to get lost in demographics and data. We want to go beyond the data to gain a more holistic understanding of our residents.

It leads to uncovering much better information about people's motivations and aspirations than self-reported information through a survey. We get a better understanding of how residents think, what they see, how they feel, what they hope for, what they fear, what goes well in their day, and where their pain points are. We can then map those insights using empathy and journey mapping to gain an understanding of what the end-to-end experience is for the resident.



Example of empathy mapping (Source: GNB Silobusters)

A foundational piece of the work through Digital Fredericton is the Citizen Experience Strategy. We will use ethnography, which we piloted during the finalist phase, to gain deep learning of different segments of the population in both the Fredericton and St. Mary's First Nation communities. As part of the ethnographic process for each segment, we will:

- Have *in-depth one-on-one conversations/interviews with residents, representing a wide range of segments*. The hour-long conversations occur at the participant's home or other familiar place.
- Do *“walkabouts”/“day-in-the-life tours”* with 1-2 participants in each segment in order to observe and learn more about the challenges identified in interviews.
- Use *empathy and journey mapping* to be able to visualize where the high and low points of the resident's experience is and map out the moments that matter.
- Based on the information uncovered as part of these exercises, *develop distinct empathy-based personas* within each segment and document their current experience, aspirations and pain points.
- To test our findings, we will supplement ethnography with broader traditional engagement tools.
- Document the “moments that matter”, we will analyze our efforts to *develop new and unique insights* to understand the future experience desired by residents to be able

to both ideate and prototype segment-specific solutions and make overall improvements to common, digital infrastructure used by all residents.

This process is a very effective way to test and challenge existing assumptions and uncover new and unique insights.

Piloting our "Discover and Design" Approach

During the finalist phase, we piloted these engagement methods to test their effectiveness and suitability in our Smart Cities operating model. It proved to be very effective in discovering more about specific resident segments and define the unique challenges they face. During the pilot activities many existing assumptions were tested and broken. This collection of field research ultimately leads to real evidence-based decision making.

As a **very early pilot of the ethnography**, and to secure long-term support for this method, nearly all the City of Fredericton's senior leadership participated in a workshop exercise – interviewing citizens from different customer segments, developing personas, mapping out what a typical day looks like for that persona, and identifying the key challenges that persona faces. They then designed concepts that might help solve some of the challenges. As a result of this engagement, the senior leadership of the City is energized by this approach because the level of engagement is much deeper than normal methods of public engagement and resulted in new insights that would have previously not been considered in service delivery, public policies and setting government priorities.

We then did a **full pilot for one segment, conducting ethnographic interviews with 13 older adults**. As a result of hour-long, in-depth conversations, we got a clear sense of what the participants' current experience is, what the "moments that matter" are in their day, what challenges they face and what they would like to see improved to make their experience in Fredericton a better one. We used the information to develop three distinct personas based on analysis of the information.

We piloted a **"day-in-the-life-tour"** as part of the work to uncover challenges for another key segment – persons with mobility-related accessibility challenges. Appdigenous Founder and CEO Melissa Lunney accompanied Zack, a young man who uses a wheelchair, as he went around the City. We filmed the experience and attached a Go-Pro camera to Zack's wheelchair to gain perspective of a person with accessibility challenges and experience a day in their life as a tool to develop insights. Through his interactions with people and the environment and conversation with Melissa, Zach revealed several accessibility barriers he faces in Fredericton.



Appdigenous Founder and CEO Melissa Lunney accompanies Zack on a day-in-the-life tour.

As part of the finalist phase, we also conducted a **market research survey** for Doorable. The survey was largely distributed online through the City of Fredericton's social media, Ability NB's (the provincial organization for persons with accessibility challenges) social media and email list, and physical copies at the Stan Cassidy Centre for Rehabilitation (where the link to fill the survey out online was also promoted).

More than 100 New Brunswickers who identified as having an accessibility challenge (or in a few cases, caretakers for people who have an accessibility challenge) filled out the survey. 57 of respondents reported living in Fredericton and the remainder from other communities in New Brunswick. The data indicates not only receptivity within the City of Fredericton but also the opportunity to spread the technology elsewhere.

Key Insights Informing Prototypes

Without a network, older adults seek to build their own. Those who live alone, don't have family close by, or are more vulnerable have created their own support networks through friends and neighbours. We found an extraordinary example of this in talking with Sharon (last name held upon request).

Sharon is in her 70s and she and a group of her female friends who live alone in the city use a crossword app on their phones as a way to check in on each other each morning. If one of them hasn't played a word by 9 a.m., the others will arrange for someone to visit their house to make sure their friend is okay. One of the friends didn't play her word. When they went to check on her, they found she had fallen into a diabetic coma. They called 911 and emergency responders saved her life. Without connection to this network, this woman would not be alive today. But not everyone has access to these networks. Social isolation is a real demonstrated issue across the country that needs to be addressed.

Volunteering is limited by mobility. When older adults are unable to drive, their participation in volunteering decreases. Older adults are actively looking for ways to give back their time and energy in Fredericton, but are prohibited by limitations in their mobility.

Accessibility challenges prevent people from participating in the community. 88% of people with accessibility challenges that responded to the Doorable survey found that lack of accessibility prevented them from going to public places that they'd like to/need to go (83% for Fredericton). Respondents reported that buttons or accessible doors themselves are often broken and that the buttons too hard to push (whether due to an issue with the button itself or the user's limited strength) or were in an awkward location or height.

77% of respondents felt that a solution that would open "push button" accessibility doors from a smart phone or table would or might make a difference whether they would enter a building (83% of Fredericton). Respondents also overwhelmingly valued a platform to communicate about accessibility barriers (87% for all respondents; 84% Fredericton only),

"I think that [Doorable] is an excellent idea because I am in a wheelchair and I find it hard to go places when there is no one with me. I can't use my arms, so I am not able

to reach the button. Also, often times the button are in places that no one in a wheelchair could reach unless they have full mobility in their arms. [...] I am very intrigued, and I think this is something that would be great and that people with disabilities would benefit from. [...] I would really like for this new invention to come to life so that people with disabilities can live independently and don't have to rely on someone to open the door every time they want to go somewhere."

Erica (last name held upon request)

Use of technology is more common among certain segments than we might think. We came up against an assumption during the finalist phase that perhaps technology use is not common among the segments we focused on in our finalist phase due to either unfamiliarity or unaffordability. We found that assumption was flawed.

The ethnographic interviews revealed that email, Facebook, and Skype, among other online applications are all commonly used by older adults. Although technology literacy may not be the barrier, affordability can be. Those with financial limitations tend to rely on public access or choose to live without it entirely. This creates a level of unfamiliarity not from being disinterested in technology but rather out of circumstance. In a similar vein, conversations with homeless serving agencies have revealed that many people experiencing homelessness do have a smartphone – either their own or through sharing one with another person, but with limited means, they generally can't afford a regular phone or data plan, so they rely on free WiFi to use them. Early indicators are smartphone and tablet use is widespread among people with mobility-related accessibility challenges – nearly every respondent in the survey noting that they use one or the other.

This shows how effective this approach can be in challenging and confirming or debunking assumptions.

Living Lab – Ideating, Prototyping & Testing Solutions

Co-creating with community to develop tailored digital solutions for residents

With much clearer insights on the aspirations and challenges our residents face, we will continue our Citizen Experience Strategy work that will be undertaken early in the implementation phase, sharing the findings and **partnering with entrepreneurs, residents and community organizations** to brainstorm ideas/solutions to address problems, and create prototypes of those solutions to test them with residents they are designed to help.

- We will conduct **brainstorming/ideation sessions** with frontline staff and managers from the City of Fredericton and St. Mary's First Nation, entrepreneurs from the local technology community, as well as NPOs that provide frontline services to the residents in the segment we're designing for. We will tap into their creativity to **generate exploratory concepts guided by the resident insights** for data and connected technology solutions that will solve a specific issue for each of the resident personas to help them achieve their ambitions and overcome the barriers they identified. The ideas will be prioritized for implementation by the participants in the session based on feasibility and impact.

- As part of our Digital Fredericton Connected Community layer, we will work with businesses/startups and others to create prototype solutions using **rapid prototyping & co-design workshops** to see how ideas might work. Prototypes could include creating mock-ups and wireframes or a small minimally functioning product to be able to better show the capability.
- We will continue to directly involve residents in the design of solutions through **co-design workshops**, involving them in the prioritization of features and what should be included in the design.
- Once a concept has been prototyped, we will move to **testing and refining solutions**. We will hold usability testing with residents, finding out what works and what doesn't about the product so the design can be iterated and improved upon. Based on the feedback received, the idea will be refined and launched to the public. The community will continue to act as a living lab for new technologies and solutions.
- In the design and testing stages, we will also **engage with accessibility and other experts** that work with the people we're designing for (e.g. people with expertise in accessibility standards) to ensure we design with diversity and inclusion in mind, taking into account how certain population groups may have different abilities to access, use the technology, and benefit from the solutions we design.

Piloting our Approach for Ideating, Prototyping and Testing

Over the course of the finalist phase, we have piloted the core elements of this approach. After the "discover and define" efforts we piloted with older adults and persons with accessibility challenges, we worked with community partners to ideate, prototype and test new digital solutions to the challenges and ambitions identified and refined the Community Digital Hub to personalize it for the target segments. At the end of the finalist phase, the solutions are at various stages of design, development and idea testing.

The progress completed in the development of this proposal demonstrates our Smart Cities Model in action: connecting people to what matters most to them, creating an assessible welcoming community, and taking strides towards personalized digital inclusion.

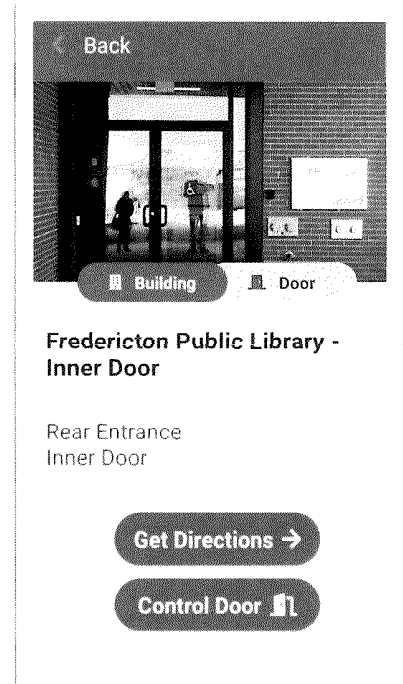
Doorable for Improving Accessibility

Over the finalist period, Doorable has moved from concept to early stage production. Hardware was developed and installed in test sites and more advanced user-centred design was used to build the software application. These were field tested with the target audience.

- Appdigenous created prototype hardware and a plan for prioritized features based on the challenges and other insights identified by people with mobility-related accessibility challenges in the design and discover stages. Guided by human-centred design principles, usability testing was conducted with the participation of a person who uses both a wheelchair and a walker to inform the most intuitive and useful app development.

During this phase, consultations were also held with Stan Cassidy Centre for Rehabilitation occupational therapists specializing in assistive technology and an assistive technology specialist from CNIB (Canadian National Institute for the Blind) to identify ways to make the technology most accessible and inclusive. Consultations are also being undertaken with owners-operators of public spaces to understand their needs as secondary users of the technology.

Based on the insights gained during this phase, a first version of the app was developed. Hardware was deployed at six locations (including City Hall, Fredericton Public Library, Research and Productivity Council, Brookside Mall, Grant Harvey Centre and Willie O'Ree Centre). As of February, the technology is being tested in-the-field with a group of users who have mobility-related accessibility challenges and those with specialized knowledge associated with the technology or manage/own buildings. Already, the app is available publicly for download in Google Play and Apple's App Store.



Screenshot of Doorable app

Companion Check-In App for Older Adults

The ethnographic research revealed that one of the personas of older adults include individuals who live alone, have no family in the community, and are therefore potentially vulnerable. Without a family network, being able to connect with friends to check in on their wellbeing is important to this group. We also saw that giving back to the community is important to this persona, although their ability to do so through volunteering is hampered by difficulties getting around the city without access to a vehicle of their own. These older adults are very familiar with Facebook.



Screenshot of the Companion Check-in App

We held an ideation session to come up with solutions for some of the insights uncovered. Inspired by the story of the women who check on each other by playing a crossword game app, we came up with the idea of an app that would allow people to interact and check in on friends by playing simple games while also earning points to give back to the non-profit organization of their choice. In just a few weeks, we partnered with a local startup (Mav Synergetic) to rapidly prototype and test a Facebook-based companion check-in app.

The prototype was tested for user feedback with a user-centred design test with an older adult, and a broader market acceptance test using Facebook's demographic and geographic targeting capabilities. Over a period of just four days, 574 older adults in Fredericton (between 3-4% of the city's older adult population) responded to the test promotion and accessed the app. An in-app survey was administered to present the concept of the check-in companion function of the

app, to which 86% of users responded positively. Two non-profit organizations were also interviewed about the value of the app, one of them specializing in supporting people with intellectual disabilities, noted that the check-in function would be incredibly helpful to many of the people it serves, not just older adults.

The testing confirmed the app's value proposition, with an overwhelmingly positive response in a short time. Primary feedback from the older adult during the user-centred design test was that app seemed to be designed for a much younger demographic and its purpose was unclear. This demonstrates the value the iterative user testing approach. The next step will be working on the app's design to respond to the concerns.

Recognizing that a game may not appeal to everyone, the City developed second prototype application that tested advanced technology features of voice command and IoT devices. The prototype supports four types of simple and non-intrusive check-in interfaces including: a simple responsive browser-based web interface, Amazon's Alexa family of devices using voice command, a simple IoT connected button that is uniquely registered to a specific user, a traditional telephone-based Interactive Voice Response (IVR) system that uses caller ID. The City will conduct further user-testing to get feedback on these new interfaces.

Hullo App for Newcomers

Newcomers are important to the growth of Canada's communities, including Fredericton. Connecting newcomers to what matters most to them will help them to integrate into their communities more quickly, feel welcomed, and build new lives in our Cities. Ali Allaiddin is a newcomer to Fredericton and an entrepreneur. He says, "When I came to Canada, I struggled to find connections that could help me navigate everyday life and I realized there was an opportunity to make it better." Based on his and other newcomers' experiences, Ali came up with the idea of creating an app called Hullo that would help with the inclusion of newcomers in the community.

Using the approach, we have adopted for all our Smart Cities projects, Ali conducted a user-centred design workshop to test two assumptions:

- Newcomers want to integrate and belong to a community with quick access to services, and that an app can help with that.
- Newcomers who first arrive can be, for a time, invisible to the groups and individuals that exist to help them.



Journey mapping with newcomers during a user-centred design workshop.

A minimum viable product of the app was developed to test with users, including a simple sign-in/registration and steps to create a profile, a Google Map integration with language

preference and chat interface for newcomers to interact with settlement organizations/agencies (such as the Multicultural Association of Fredericton). Further development will allow Hullo to present users with a map filled with local resources, including location-tracked transit and shuttle services, geographically-indexed calendar events, and job postings. Newcomers will be able to be automatically added to their own language and cultural communities upon registration.

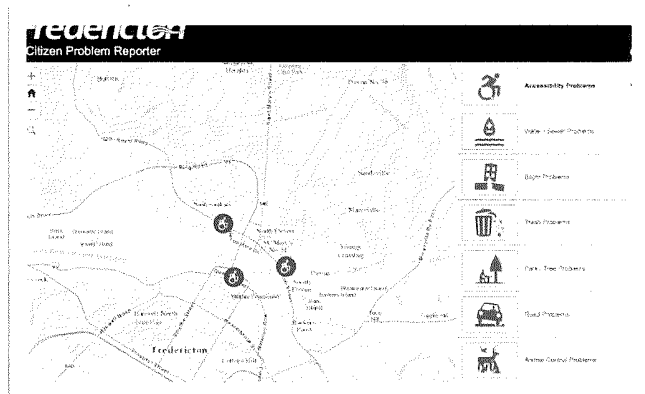
Finding meaningful employment opportunities was identified in the user-centred design as one of the most important aspects of settlement. The MVP prototype is being further developed with this feature set first.

Like the Check-in Companion, Doorable and other Connected Community apps developed, Hullo will be connected into the Digital Community Hub.

Digital Community Hub

To design the initial prototype of the Digital Community Hub, we held co-design workshops with two segments – older adults and people who have mobility challenges – to find out what information was most important and how they preferred to see it curated for them. We partnered with Esri Canada Limited to build a prototype through which users can access the shared information of our database in an easily accessible and personalized way.

The prototype includes: a Smart City Dashboard feature using existing and prototype data from the City and other sources; segment-specific curated personalized digital inclusion resources (events, information, services) most relevant for older adults, people with mobility-related accessibility challenges and people who are at risk of/experiencing homelessness; and a citizen reporter feature where users can report problems and upvote/comment on problems others have reported, providing a living database of issues in the city. Other key features of the Hub, including cause-based hubs for like-minded organizations to collaborate on issues of common interest will be developed in the implementation phase.



Screenshot of the Citizen Reporter feature of the Digital Community Hub prototype.

GIS mapping is embedded in most of the features so users can easily see where resources and where issues are reported. Users can create a personalized profile, in order to earmark the information most relevant to them and to follow progress on issues / items of interest (e.g. if they report a problem, they can receive a notification when it's been addressed).

To see results of the ethnography, the prototypes completed, the user-centred workshops and our video content, along with links to downloadable prototype applications, please visit www.fredericton.ca/smartcity.

Stakeholder Partnership and Collaboration

One of the key opportunities of this proposal has been our stakeholder collaboration. From the very start, we've relied heavily and intentionally on working with a broad cross-section of community partners and thought leaders in technical innovation, entrepreneurship and social innovation through our Smart City Task Force. **In addition to the 40+ representatives from more than 20 organizations** that have worked to collaboratively design this proposal, other stakeholders have been and will continue to be engaged through the projects. Ongoing stakeholder engagement includes:

- Holding **education/Q&A workshops** for non-profit organizations on the benefits and concerns surrounding data collaboration.
- Engaging **11 early adopter NPOs** for Non-Profit Data Collaboration, beginning with mapping out their current data collection, privacy and use practices and policies (see *Governance* for list of organizations).
- Engaging **five homeless-serving agencies** on their challenges and the benefits of adopting a shared platform. Some of the homeless serving agencies have already begun or completed data transfer to HIFIS4, with plans to bring on other agencies in subsequent years (outreach to the other agencies has already begun)
- Consulting with **owners-operators of public spaces** to better understand how to get the highest participation in installing Doorable technology, including bringing on Brookside Mall as a partner organization. Doorable plans to conduct a research study summer 2019 to determine the number of wheelchair push button doors and then rolling out the technology starting with public and institutional access, and then private sector.
- Meeting with organizations to **understand the availability of data sets and what's missing to build out the Digital Community Hub concept**.
- Holding **workshops with City of Fredericton staff** at all levels to understand business processes and opportunities to improve, to select the right technology to implement to streamline operations, and to establish the roadmap forward.
- **Briefings** with the Mayor and Council for City of Fredericton and Chief and Council for St. Mary's First Nation on the progress of our Smart Cities Challenge.

We also have and will continue to establish **stakeholder partnerships and use stakeholder networks** to identify participants for and get word out about engagement opportunities.

Additional Insights That Helped Shape the Proposal

Demographics alone are not a good identifier of challenges. In the case of older adults, we discovered factors that affected the challenges they face including whether or not they live alone, their income status (e.g. stable, fixed, limited), their access to a car/transportation, and their state of health. Instead of looking at older adults as one big segment, we're better

able to contextualize the unique situations and develop a more nuanced understanding of the realities that exist within the segment to identify and address challenges when we break it down on these levels. This shows us the importance of getting to know our residents in a deeper and more comprehensive way through the engagement methods in this proposal.

We need to engage with residents directly to learn how they identify themselves and about their lives instead of making assumptions. There is a perception that older people are lonely and feeble. As we confirmed in the pilot ethnography exercise, “seniors” covers a very large age group, and many people within it live active and independent lives. In fact, we discovered that even if some may use it to describe themselves, the term ‘senior’ can carry subtle ageism. As one 69-year-old participant said, “I don’t like the term senior. I’m an adult, I don’t think of myself as anything else.”

People enjoy the opportunity to be included in the early stages of design of innovative concepts. Here’s what one participant in our older adult co-design workshop had to say about the opportunity to participate in a co-design workshop for Digital Community Hub:

"It is heartening indeed that seniors are being afforded the opportunity of involvement in a workshop of this nature. I would be most grateful to be included."

Meris K Brookland

Engagement Risks and Planned Mitigations

Risk	Mitigation
Not getting a true representation of the community in engagement efforts (not fully reflecting diversity or those that don't traditionally participate in engagement)	<ul style="list-style-type: none"> Reaching out widely through community networks for user-centred design efforts, including non-profits that serve those who are often underrepresented in engagement efforts. Rewarding people for their time (e.g. using grocery cards or other incentives) to reduce the barriers to participation.
Failing to get perspectives of important stakeholders that are tight on resources and failure to communicate benefits of participating	<ul style="list-style-type: none"> Minimize off-site training/consultations to save time. Use regular social media, email updates to share progress, opportunities for feedback, and success stories of how stakeholders benefit from projects.
Confusion/speculation from staff and stakeholders around what's happening, how things will change with the Transformation	<ul style="list-style-type: none"> Establish a Transformation Office to coordinate Digital Fredericton effort in a structured way, including integrated stakeholder engagement/change management plan that aligns all projects. Develop a robust Transformation Hub (e.g. SharePoint site) to host timely and accurate project details for staff and use multiple modes of communication. Use tools, such as ChangeScout, to identify communications based on change impacts and schedule distribution for targeted messages to end-users based on unique impacts.
Leaders are silent and “invisible”	<ul style="list-style-type: none"> Build / refine Sponsorship Cascade to expand the engagement of key leaders across the business.

Project Management

Road Home Digital Enablement

Scope

This project will build digital infrastructure to support people who are experiencing homelessness and modernize the core systems that homeless serving agencies require to more accurately assess needs and increase service coordination.

- Connect all homeless serving agencies in Fredericton and St. Mary's First Nation with a shared data platform (HIFIS4) (deployment, data transfer to HIFIS4, and staff training for the system and create a consistent triage model).
- Feed de-identified/aggregate data to the Digital Community Hub.
- Deploy free, high-speed internet access at all homeless shelters as well as computers/kiosks for resident use.
- Deploy and upgrade free high-speed internet access in public places in the City center and on transit.
- Enhance and design new self-serve digital personalized inclusion resources as part of the Digital Community Hub.
- Provide first responders with digital resources so they can more effectively help people in the field.

Goals

These activities are designed to reduce barriers for people experiencing homelessness to reconnect / remain connected to community. They will:

- Help homeless serving agencies connect residents with what they need most in a continuum of care more quickly, with a more coordinated approach.
- Reduce the need for individuals to re-tell their story to multiple service providers.
- Allow for more efficient operations for shelter staff.
- Offer a necessary, easily accessible, high-quality internet connection.
- Offer a one-stop for enhanced, relevant online resources for shelter residents and first responders (e.g. places for a free meal, laundry service, crisis support, etc.).
- Take a more proactive, preventative approach in addressing chronic or episodic homelessness and help intercept those at risk.

Project Committee

The committee is comprised of subject matter experts and community stakeholders including: Community Action Group on Homelessness, City of Fredericton, St. Mary's First Nation, Fredericton Homeless Shelters Inc, John Howard Society of Fredericton, Capital Region Mental Health & Addictions, Youth in Transition, and Ignite Fredericton to lead the project.

Sustainability Beyond Project Lifecycle

At the end of the five-year project, the homeless serving agencies will have a shared client management system and coordinated intake and assessment system to better serve clients. It is anticipated there will be operational efficiencies due to reduced redundancies in the homeless serving system. This time can be reallocated to other priority areas. It is also anticipated that where HIFIS4 is a federal platform, that there will be a renewal agreement between adopters and the government for the sustainability of the system.

Non-Profit Data Collaboration

Scope

This project will connect NPOs with provincial and municipal data infrastructure and will build community capacity to collect data, establish measures and integrate with government and community data.

- Work with NPOs to establish data-sharing agreements.
- Develop consistent data collection standards based on academic research and security/privacy protocols.
- Develop data entry collection tools, templates and DIY data toolkit for NPOs.
- Transfer, de-identify and link data with provincial data infrastructure at NB-IRDT.
- Aggregate and anonymize data to the community level and make it accessible via the Digital Community Hub and provincial open-data portals.
- Run custom analysis of data in-house and in context of community.

Goal / Expected Results

By enabling community-wide engagement in the use of data and improving how our non-profits collect and use data, the project will enable NPOs to more accurately measure efficiency and impact, community needs and recognize gaps and overlaps in service. They will be able to create greater community impact through effective and targeted service design, delivery and evaluation, increased partnerships, and have more outcome-oriented funding in order to more effectively address community problems and influence policy development.

Project Committee

The committee is comprised of subject matter experts and community stakeholders including: Greater Fredericton Social Innovation, City of Fredericton, St. Mary's First Nation, NB-IRDT, NB-Social Policy Research Network, United Way, Fredericton Community Foundation, Fredericton Public Library, Civic Tech and Saint Thomas University to lead the project.

Sustainability Beyond Project Lifecycle

At the end of the five-year project, the NPOs will have 20% of Fredericton's non-profit agencies with the ability to make data-based decisions that will help them to better serve their clients and our community. Greater Fredericton Social Innovation will continue to support the NPOs in data collaboration and lead post-project activity that maintains growth and development. It will host regular gatherings to develop more advanced uses of data.

Digital Fredericton

Project Scope

The project scope includes work across three areas, which will be informed by the desired citizen experience, as defined by the Citizen Engagement Strategy.

1. Core operational systems

This involves implementing modern cloud applications for **streamlined utility and customer billing, work order management, and field service delivery**, which will:

- Enable self-serve customer access to billing accounts with real-time balance and transaction information systems to enable a transition to smart meters.
- Provide a centralized view and point of control for monitoring field service activities to increase productivity and reduce costs.
- Ensure adequate staffing and on-time arrival of field service personnel and more accurately predict a window for customer service delivery for improved service.
- Diagnose symptoms and potential resolution for service calls before dispatching field service resources to prevent unnecessary service calls.

2. Implement core HR/Talent strategies & systems

- Develop a **digital talent strategy** to align human resources, recruiting, training and development to this vision.
- **Automate staff scheduling**, auto-selecting the best employees for the work based on rules, history and future schedule needs, and transforming how the City prioritizes, assigns and delivers work assignments.
- Modernize **talent and performance management** and make it an ongoing activity through continuous conversations on goals, alignment, frequent checkpoints to review progress, and coaching to enhance performance.

3. Customer facing strategies & systems

- Developing a **comprehensive citizen experience strategy** using ethnography and user-centred design to understand and enable desired resident experiences.
- Implement **CRM systems for 311 services** to understand customer needs and develop operational strategies & technologies that close the gap between the current service delivery approach and the digital experience desired by residents.
- Deploy a **self-service citizen portal** that empowers residents to help themselves to services and information, making it more convenient and faster for residents.
- Create technology interfaces and an innovation lab space to enable the development of **connected community applications**.

Goals / Expected Results

1. **Operational efficiencies** achieved by streamlining processes and offering self-serve options, freeing up internal staff to focus on more analytical and strategic tasks.
 - Faster and more convenient billing and collections for citizens.
 - Repurpose 50% of account billing work to more relevant citizen-facing roles.
 - Improve customer service delivery.
 - Increase internal operating efficiencies and generate operational savings.
2. A **nimble, agile, innovative workforce** that can apply digital solutions to citizen issues.
 - Clear view of the talent requirements to deliver a new service experience.
 - Engage employees and help them be more strategic and productive in their work.
 - Track resources to increase productivity and improve service delivery to citizens.
 - Efficiencies and cost savings through reduced overtime costs.
3. Provide citizens with **highly personalized, interactive services, access to open data**, and provide the City with **better analytics about what matters to residents**.
 - Convenient and intuitive access to information and services.
 - Better understand and communicate with residents and businesses in real-time.
 - Capturing real-time data to address priorities and needs to make more effective, more resident-centric decisions.
 - Facilitating the environment for potential and existing businesses to innovate through open data access, which will lead to economic development.

Project Committee

The committee is comprised of subject matter experts to lead the digital transformation. Please refer to *Governance* for an organizational approach to project oversight of this area.

Sustainability Beyond Project Lifecycle:

This initiative will generate operational efficiencies, which will be transitioned to sustain ongoing customer service roles and initiatives.

Digital Community Hub

Scope

- We will fully build out a multi-level platform that will bring data sets & digital resources from diverse community sources to measure progress on key smart city/quality of life areas, create communities of interest for collaboration on issues, and offer a personalized curation of resources, tools, information and services that matter most to users.
- Establishing data sets to feed into census aspect of the Digital Community Hub and creating process for data identification and refinement.

- Developing partnerships with organizations to provide data and tools to include on the Hub, and identify alternative ways for people to connect non-digitally.
- Fully developing a platform for each of the Hub levels.
- Developing an opt-in profile for people who want to provide personal info to personalize the information, resources, and services displayed on their Hub.
- Conducting user testing of the platform.
- Creating an engagement survey mechanism to be conducted at regular intervals.
- Monitor our progress towards becoming a Smart City and identify indicators for mobilizing to continue improving the quality of life for all our residents.

Goal / Expected Results

The goal is to give a complete and detailed profile of our community with rich data on who is in our community and their challenges and priorities.

- Increase the sense of citizen inclusion and participation.
- Allow for better informed and proactive decision-making by the City, St. Mary's, organizations, and entrepreneurs, supported by citizens' core needs.
- Improve the ability for citizens and organizations to effect change and have a voice in decisions in their community (participatory democracy).
- Enable open data access so residents and businesses can design solutions to address community problems, which leads to new innovations and economic development.
- Enable more innovative responses to service delivery.

Project Committee

The committee is comprised of subject matter experts and stakeholders including: City of Fredericton, St. Mary's First Nation, WSP Canada, the University of New Brunswick, and the Fredericton Community Foundation to lead the project.

Sustainability Beyond Project Lifecycle

By year five, it is anticipated that the Digital Community Hub platform will be complete and operational. As we generate efficiencies in internal processes, the City will redeploy staff for the sustainability of the Digital Community Hub. As we develop the hub, organizations will have a space to specifically evaluate their direct and indirect impact on our community's well-being. Alternative funding sources will be explored through subscribing partners.

Doorable (Developed By Appdigenous)

Scope

Appdigenous will fully develop hardware and software to make built physical infrastructure more accessible, available free of charge to users (residents). With the wide-spread adoption of Doorable technology that this project will enable, Fredericton and St. Mary's will become Canada's living lab for accessibility.

- Map the current inventory of push button doors across the City.
- Produce and deploy hardware on doors where there currently is a "push button" throughout Fredericton and St. Mary's First Nation.
- Further develop the core user app to allow users to communicate directly with each other and with facilities about accessibility barriers.
- Develop a next version of existing Doorable hardware (Bluetooth-based), that will enable Doorable to be web-based; significantly enhancing the range of services available through the app.
- Build data through interactions between citizens and infrastructure (e.g. count of door opens, use geo-location features for those that opt-in to specialized research to identify barriers/gaps in accessibility in the community, and help better inform municipal decisions with respect to accessibility).
- Build an application that will assist installers in rolling out the technology in diverse facilities and configurations.
- Build a revenue stream through subscribing facilities, that will allow those facilities to push information on services, programs, events and goods to (opting in) individuals who use Doorable to access their space(s).
- Expand the technology throughout Fredericton and St. Mary's and to other communities in the province and across Canada.

Goal / Expected Results

The goal is to make it easier for people with mobility-related challenges to live and get around their community with improved accessibility, allowing them to be more independent & fully participate in education, jobs, services, the community. This will be done by making it easier for people with accessibility challenges to get into buildings and to access better information about options available to them as well as by giving decision makers better information on gaps in accessibility, so that they can address them. Doorable will also contribute to the Internet of Things ecosystem as a catalyst for other infrastructure changing advances and become Canada's product development living lab for accessibility.

Project Committee

The committee is comprised of subject matter experts and community stakeholders including: private sector lead-Doorable, City of Fredericton, New Brunswick Community College, Stan Cassidy Rehabilitation Centre, St. Mary's First Nation, Research and Productivity Council, AbilityNB, and Hotspot Parking (private sector) to lead the project.

Sustainability Beyond Project Lifecycle:

Appdigenous has developed a commercial business plan for Doorable. The Smart Cities funding will seed the preliminary market testing. With a proven revenue model, Doorable will access investor and government funding to sustain business development.

Budget, Timelines and Milestones

Please see detailed project timelines and budget shown in *Financial* and milestones and progress payments shown in *Performance Measurement*.

Overall Project Management

Resource Assessment Management Plan

The following criteria will be used to manage the resources, both human and equipment, for project implementation.

Authority/responsibility	<ul style="list-style-type: none"> Smart Cities Manager
Timing for resource management	<ul style="list-style-type: none"> Monthly meetings
Methods of acquiring resources	<ul style="list-style-type: none"> Job posting competition to acquire HR Secondments of City Staff to this program Procurement process to acquire materials/services
Training requirements for resources	<ul style="list-style-type: none"> Training resources will be engaged as need be based on technical requirements for project implementation.
Tools for managing resources	<ul style="list-style-type: none"> Resource performance progress reports Committee meetings – resource performance Schedule baseline & cost baseline – resource assignments
Tools for resources measurement	<ul style="list-style-type: none"> Resource performance review
Authority/responsibility for accepting resource changes	<ul style="list-style-type: none"> Smart Cities Manager Project Committee Leads

Human Resource Requirements

Resource Role	Timeframe	Responsibilities
Digital Fredericton		
Manager of Corporate Systems Renewal	Existing and ongoing	Leads the Digital Fredericton Transformation, provides visionary leadership on renewal of corporate systems and alignment to the Digital Fredericton Vision. Manages the strategic partnerships and oversee the project implementation, milestones and Digital Fredericton outcomes.
City Subject Matter Experts	Secondments as required	Provides subject matter expertise on City service delivery, and is seconded to agile project teams with technology partners to develop core systems and CRM projects throughout the project lifecycle.
Redeployed internal staff		Staff time gained through efficiencies generated in modernizing core systems will be redeployed to digital customer relationship management.
Digital Community Hub		
Digital Community Hub Coordinator	5 years/ongoing	Developing a structured five-year Digital Community Hub Plan in consultation with the Smart Cities Manager; data discovery and establishing/negotiating data sharing agreements, maintaining data sharing partnerships with organizations; liaising with Digital Fredericton team/St. Mary's ethnographer in terms of receiving ethnography inputs (segments & personas and insights); coordinating user-centred design as it relates to the Hub and feeding this into the design; developing data maintenance/renewal plan and long-term data strategy for future sustainability.
Data Analyst	5 years/ongoing	Modelling data; conducting analyses; liaising with data contacts with partner organizations to obtain aggregate data transfer; inputting data, facilitating the creation of required data; and assisting with data discovery.

Content Creator	5 years/ongoing	Creating content and assisting with the implementation of the Smart Cities marketing/communications plan includes: advertising/promotions for public engagement; hub/segment releases; social media and website content generation; building the brand, etc. This position also assists with the data entry and supports the overall Fredericton/St. Mary's Smart Cities Program.
Appdigenous		
CEO	Ongoing	Overall business leadership and development.
President	Ongoing	Operational management of Doorable.
Technology lead	Ongoing	Updating of Application(s). Leadership role with outside developers.
Finance Lead	Ongoing	Management of Financial plan, budgets, payroll, billing and costing systems.
CRM	Ongoing	Technical support for users, installers and subscribers, social media promotion.
Installers/Service	Ongoing	To install Doorable hardware on subscribing facilities, capturing information required to populate the User App (maps, etc.). Service existing installs.
6 Researchers	Jun-Aug/19	To undertake the inventory project of all accessible doors in Fredericton and research strategy.
Data Entry Specialist	July 1-Sept/19	To input data from inventory project.
Data Analytics Expert	Sept/19	To analyze data from inventory project.
Research coordinator	May – Oct/19	To coordinate research for inventory project.
Non-Profit Data Collaboration		
Project Manager		Resourced through GFSI.
Process Design Consultant		Resourced through GFSI.
Data Analyst		Resourced through NB-IRDT.
Road Home Digital Platform		
Resourced through participating agencies and in-kind partnerships.		

Smart Cities Program Management		
Smart Cities Manager	5 years/ongoing	<ul style="list-style-type: none"> Managing the Digital Community Hub administration. Liaising with project committees to facilitate the successful implementation of projects. Managing budget oversight, and funding disbursements to the five projects. Reporting to Infrastructure Canada. Coordinating quarterly Fredericton Smart Cities Task Force meetings including report generation (quarterly progress reports, budget, issue management). Managing strategic marketing and communications for the Smart Cities Program as it relates to Fredericton's brand. This includes the development of an integrated marketing communications plan (encompasses public awareness element/storytelling, leveraging partnerships with respect to marketing, public relations, refreshing GoFred brand, elevating Digital Fredericton brand, etc.). Cultivating and fostering stakeholder relations/partnerships. Managing Smart Cities Innovation Lab and liaising with potential and existing entrepreneurs as it relates to Smart Cities app development – connecting them with partners/staff and funding.
First Nations Lead	5 years	<ul style="list-style-type: none"> Lead ethnographic research initiatives.

		<ul style="list-style-type: none"> Oversee technology development and implementation. Advocate and monitor OCAP principles for First Nations data. Liaison for Digital Community hub and NPO data teams.
Privacy Officer	5 years	<ul style="list-style-type: none"> Sub-contract consultants for annual privacy audit
Chief Information Security Officer	5 years	<ul style="list-style-type: none"> Sub-contract consultants for quarterly security review and ongoing development of policy and security practices

With the University of New Brunswick and New Brunswick Community College both located in Fredericton and other post-secondary educational institutions, it is assumed that talent acquisition will be viable.

Procurement Management Strategy

The following criteria will be used to manage the procurement components of this project.

Authority/responsibility	<ul style="list-style-type: none"> Smart Cities Manager City Purchasing
Timing for procurement management	<ul style="list-style-type: none"> As required as per procurement list pertaining to requisitions
Procurement management approach steps	<ol style="list-style-type: none"> Determine procurement items required (planning) Determine lead time required & timeframe needed Complete procurement documents (as required) Determine & document decision criteria Engage Purchasing Conduct procurements (source vendor) Award & approve contracts Administer & manage contracts Verify & contact deliverables Close contracts Complete procurement evaluations
Procurement documents required	<ul style="list-style-type: none"> RFP (Source selection criteria and pricing forms) Statement of work Terms & conditions Non-disclosure agreement Letter of intent Firm fixed price contract Procurement audit form Procurement performance evaluation form
Tools for managing procurement	<ul style="list-style-type: none"> RFP/RFI Statement of Work (SOW)/Contract Standard contracts Purchase Orders Historical information – vendor performance evaluations
Measurement tools for procurement	<ul style="list-style-type: none"> Procurement baseline Approved SOW/Contract
Contracts approval steps	<ul style="list-style-type: none"> Procurements for standard contracts - approved by project management
Authority & responsibility for contract approval	<ul style="list-style-type: none"> Smart Cities Manager City Purchasing (as required for RFPs over certain amount)

Communications Strategies / Management Plan

A full-scale integrated marketing/communications plan will be developed for the Smart Cities initiative, including approaches to ensure the public and many stakeholders are kept informed on progress and given opportunities to participate in engagement activities. The following criteria will be used to manage the communication for this project.

Authority & responsibility	<ul style="list-style-type: none"> • Smart Cities Manager • Project Committee Leads
Timing for communications	<ul style="list-style-type: none"> • Public update on progress every two months • Project Committee meetings • Ad-hoc (as required)
Tools for managing communication	<ul style="list-style-type: none"> • Quarterly project status reports • Project committee presentations if required • Committee meeting agendas • Project committee meeting minutes
Authority & responsibility for accepting communication changes	<ul style="list-style-type: none"> • Smart Cities Manager • Project Committee Lead

Stakeholders

See *Governance* section for list of stakeholders and roles/responsibilities.

Risk Management Strategy

The following criteria will be used to manage the risk components for project implementation.

Authority & responsibility	<ul style="list-style-type: none"> • Smart Cities Manager • Project Committee Leads
Risk management approach steps	<ol style="list-style-type: none"> 1. Do a quarterly risk assessment 2. Identify & capture risk in register 3. Qualify & prioritize risk 4. Determine risk owner, approach and assignment 5. Update risk & action (communicate as required) 6. Close risk in register
Timing for risk management	<ul style="list-style-type: none"> • Monthly – during project committee meetings • Initiated by change control process (as required)
Tools for risk identification	<ul style="list-style-type: none"> • Committee meetings • Workshops • Brainstorming • Historical information from similar projects • SWOT analysis • Stakeholder engagement • Corporate risk register • Project risk register
Tools for risk qualification & prioritization	<ul style="list-style-type: none"> • Risk register criteria (defined below) • Decision trees • Monte Carlo analysis/what if scenario planning
Approach for risk monitoring & control	<ul style="list-style-type: none"> • Monthly review of open, prioritized risks • Communication of impact of triggered risks (meetings, status reports)

	<ul style="list-style-type: none"> Closing of completed risks
Authority & responsibility for accepting risk plan changes	<ul style="list-style-type: none"> Smart Cities Manager Project Committee Leads

Monitoring, Controlling, and Checkpoints for Project Management

The following framework will be used to monitor and manage the issues of project implementation.

Authority & responsibility	<ul style="list-style-type: none"> Smart Cities Manager Issue owner
Issue management approach steps	<ol style="list-style-type: none"> Identify & capture issue Categorize/prioritize issue (communicate as required) Assign action owner Determine issue resolution plan & due date Close issue (communicate as required)
Timing for issue management	<ul style="list-style-type: none"> Monthly - during committee meetings As required for high priority issues
Tools for issue identification	<ul style="list-style-type: none"> Committee meetings Risk triggers Escalation to Task Force Stakeholder interviews
Tools for measurements & management	<ul style="list-style-type: none"> Project issues log
Project issue categories	<ul style="list-style-type: none"> Technology Business Political/Legislative Resource Project Process Departmental Security /Privacy

High level summary of project checkpoints and contingency measures will be brought forward in the quarterly progress report to the Task Force.

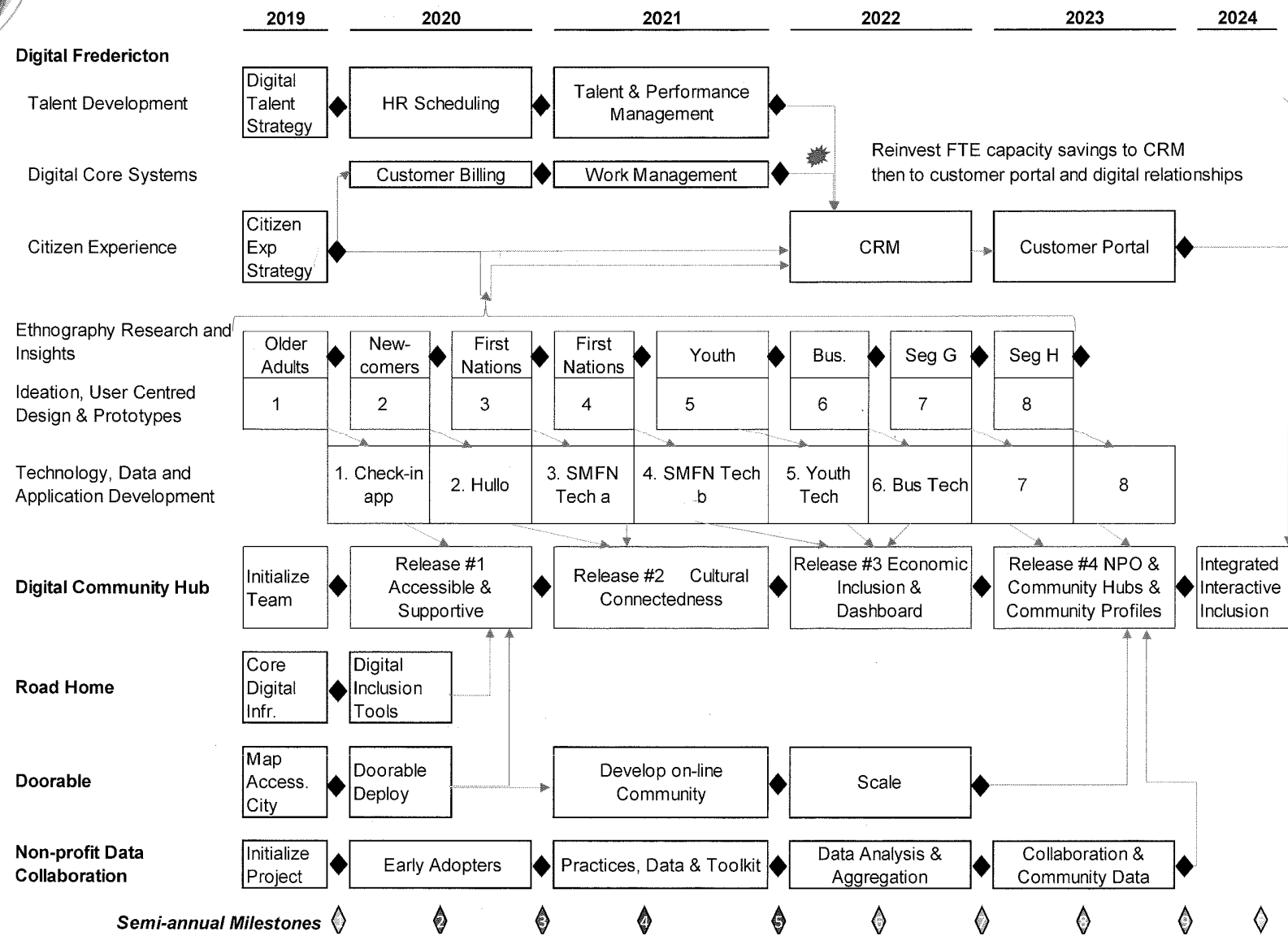
Project Management Risks and Planned Mitigations

Risk	Mitigation
Risk of building too many one-off Connected Community solutions without the full Customer Experience Strategy and necessary core & talent development systems to be sustainable and efficient (e.g. if an app is built to report a problem to the City, need to connect with automated work management system)	<ul style="list-style-type: none"> Build a detailed the citizen experience strategy that outlines the required digital talent strategy and citizen experience and the expected connections to back-end systems in the first six months. Build core systems in the first 2.5 years of implementation, which will support the sustainability and efficiency of CRM, Customer Portal, and Connected Community apps.
Poor cost management & over-runs	Develop full cost management plan, conduct monthly budget checks for each project to highlight need for adjustments/course corrections as necessary; communicate to Smart Cities Manager monthly.

Cashflow beyond lifecycle of project	Seek alternative funding sources and revenue generation models (e.g. subscription base, etc.).
Inability to meet milestones	<ul style="list-style-type: none"> Strong, organized leadership. Maintaining well defined scope & project schedule.
Talent acquisition/personnel loss	Good recruitment strategies and relationships with educational institutions, coop programs, summer internships, cross-training, advancement planning.
Lack of operational efficiency/redundancies	Ensure quality plan/process training is in place to ensure projects are completed on time and on budget.
Low morale or change fatigue leading to delays and low-quality work	Kick-off and planned subsequent pulse checks and working sessions to be tailored to equip leaders and team members with knowledge, skills and tools for success in their role on the Transformation and to fuel team effectiveness.
Failure to plan and communicate need for sustained behaviour change /change management support	<ul style="list-style-type: none"> Use change impacts to identify where behavior change is needed and establish integrated approach across all work streams and business units. Identify resources responsible for sustainment of learning content and nurturing the change agent network to include them in the design of the initial products and approaches to establish alignment. Implement robust knowledge transfer program.
Team members, key stakeholders and business leaders work in silos and fail to harness the interconnectedness of the Transformation, resulting in wasted efforts	Use training to kick-off the project and support staff in onboarding and continuous learning throughout the course of the Transformation.
Adoption risks are not meaningfully communicated for targeted action	Leverage Transformational Risk Framework to proactively identify and manage risks to adoption in collaboration with project and organization leaders.
Stakeholders are not clear about what they need to do to prepare for change	Work with the Transformation teams to develop Personas for key roles.
Business leaders do not take ownership for their stake in the change journey	Use digital change tool (e.g. ChangeScout) as the repository for stakeholder and change impact assessment and readiness dashboards that can integrate across the Transformation for a holistic view.
Losing relationships with community organizations due to lack of time/changing players	Hiring a community digital hub coordinator to establish and maintain relationships, ensure continuity of relationships when there is a change in personnel.
Failure to get/keep NPOs and homeless serving agencies onboard with the projects that rely on them sharing data because they don't see the benefit of participating	<ul style="list-style-type: none"> Start with a small number of NPO early adopters for projects, engaging closely/maintaining relationships to identify what's working, what's of benefit, and what could be improved to make it easier or yield more benefits for them, addressing any issues. Be transparent about the progress made, successes/benefits/ROI achieved, and how we're addressing issues that have surfaced.
Increased workload for NPOs, inconsistent/invalid data, competency for data mine analysis for ROI	Staff training, train the trainers, standardized system and data standards.
Boxing out NPOs that provide important services but don't know how to use the data, then receive less funding in outcomes-based grants	<ul style="list-style-type: none"> Skills training and education on how to use data. Civic Tech Fredericton team will partner with NPOs to help them link and analyze their data in-house and when linked with other open data sources. Each member of Civic Tech Fredericton will "adopt" a Cause-Based Hub and be the go-to person for data analysis.



Project Scheduling, Sequencing and Dependencies



Performance Measurement

Strategic Themes

Our plan is focused on measuring performance across three key strategic themes to achieve our vision.

Collaborating to Create a Welcoming, Accessible, Supportive Community

We need to create more efficient, effective and targeted services that appropriately address resident needs to achieve increased inclusion for all residents. Modernizing our community's core technology infrastructure is a fundamental step to achieving the efficiencies we need to create the capacity to offer value-added, targeted, resident-focused services. With improvements in core systems, we will be able to conduct far more effective analysis and make evidence-based and insight-driven decisions to be able best address resident service expectations. This will also allow us to offer a higher level of tailored and more resident-friendly service.

Recognizing What is Important to Individuals

This requires a deep understanding of who our residents are and the challenges they face to enjoying a high quality of life in their community. By collecting and curating detailed data and information from diverse sources – including data from community organizations, the City's CRM, ethnographic research, and connected community apps – into the Digital Community Hub, we will be able to develop much richer information on our community needs. We will use that to develop deep insights about the issues that matter to people in our community and what impact addressing them will have, developing a much more complete profile of the people we serve and the issues that matter to them. This insight will feed into the activities under the other two strategic themes.

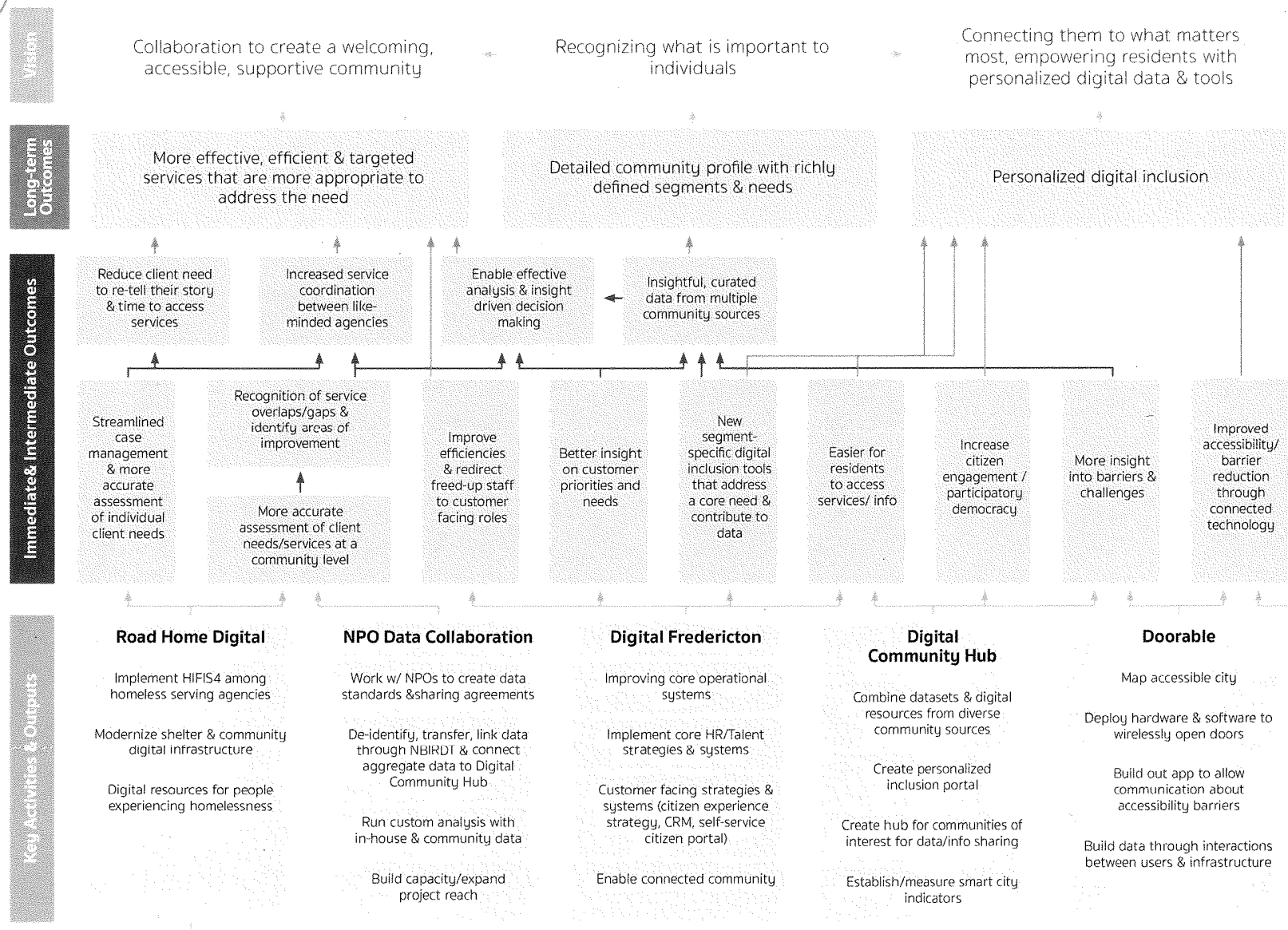
Connecting Residents to What Matters Most Using Personalized Digital Tools

Upon recognizing resident needs, we will use connected technology & digital tools to connect them to what is important. The meaningful insights we gain will inspire new solutions for under-addressed core needs and provide opportunities to further tailor how we connect people to resources they need most. By involving residents at every step of solution design, the tools created will be truly effective in both helping people find personally relevant resources to connect with their community and reducing barriers to that connection. The result will be an increase in inclusion.

There are several interconnections across project activities/outputs and outcomes. To manage performance over five years, we will monitor the three themes with metrics to track progress in achieving outcomes at each level. Following are the logical links between activities and outcomes and a balanced scorecard for each theme.



Activities, Outputs and Links to Outcomes and Strategic Vision



Measuring Outcomes and Performance Indicators

STRATEGIC THEME

Collaboration to create a welcoming, accessible, supportive community

LOGIC MODEL		BALANCED SCORECARD				
		OBJECTIVE	MEASURE	TARGET	BASELINE	DATA SOURCE
Long-term Outcomes	Services Address Needs	Increase inclusion by providing targeted services that address needs, working in an end to end environment that puts citizen engagement first	Increased percentage of citizens who are satisfied with the supports and services to help them participate fully in the community	95%	TBD	Citizen Attitude Survey; Digital Community Hub
Immediate and Intermediate Outcomes	Increased Collaboration	Increased service coordination between like-minded agencies	Number of new service collaborations between NPOs	10	TBD	Greater Fredericton Social Innovation (GFSI)-self report
		Recognition of service overlaps/gaps & identify areas of improvement	Agencies reporting use of data to improve services	10	TBD	GFSI - self report
Immediate and Intermediate Outcomes	Streamlined Service Delivery	Streamlined case management	Clients connected to appropriate services quickly	TBD	Unknown	Shelters
			Reduction in duplicate files	0	Unknown	HIFIS4
		More accurate assessment of needs using shared data	Granting agencies using data/outcomes as a criteria for funds	2	0	United Way and Fredericton Community Foundation
		Faster more convenient City services	Increase in customer satisfaction	40%		Citizen Attitude Survey
Project Activities and Outputs	Modernize Core Systems	Implement HIFIS 4 Core	Number of agencies	9	0	Homeless agencies
		Modernize core City systems for efficient service delivery and operations	Reallocating talent from admin to customer service	4000 hrs	0	Lean 6 Sigma process reviews
			Realized operational efficiencies	38%	0	
		Develop core data tools for NPOs	Number of orgs who contribute and share data	40	0	GFSI - self report

STRATEGIC THEME

Recognizing what is important to individuals

LOGIC MODEL

BALANCED SCORECARD

		OBJECTIVE	MEASURE	TARGET	BASELINE	DATA SOURCE
Long-term Outcomes	Detailed Community Profile	Develop a detailed community profile with richly defined segments & needs	% of population captured in a one or more personas	100%	0	Ethnographic Research compared to Stats Can data
Immediate and Intermediate Outcomes	Develop Rich Insights	Develop rich insights into community needs through thorough analysis of diverse data inputs connected technology and people	Number of issues that have comprehensive analysis using community input	14	Unknown	Digital Community Hub Data Analyst
			Diversity of inputs used on issue analysis (organizations, individuals, research, connected technology)	>3 per issue	Unknown	Digital Community Hub Data Analyst
Immediate and Intermediate Outcomes	Strong Community Voice	High-level on-going engagement from community organizations, interest groups and individuals contributing to caused based hubs, identifying issues, and voicing perspectives	Number of organizations contributing data and participating in cause-based hubs	10	0	Digital Community Hub Coordinator
			Number of individual monthly users participating in the Digital Community Hub	500	0	Digital Community Hub Coordinator
Project Activities and Outputs	Diverse Collection of Digital Input	ID segments and develop insights, and ideas through ethnography	# of detailed segment aspirations and experience analysis	8	0	Ethnographic Researchers Completed Reports
			# of personas	24	0	
			# moments that matter	100	0	
		Develop cause based hubs for diverse community issues	# of cause-based hubs created	8	0	Digital Community Hub Coordinator
		Connect data from connected community applications to drive insights	# of segment-specific applications providing data to the dashboard	8	0	Digital Community Hub Coordinator
		Drive insights from CRM/311	Annual analysis of top 5 issues	25	0	Service Fredericton

STRATEGIC THEME

Connecting residents to what matters, empowering them with personalized digital tools

LOGIC MODEL		BALANCED SCORECARD				
		OBJECTIVE	MEASURE	TARGET	BASELINE	DATA SOURCE
Long-term Outcomes	Personalized Digital Inclusion	Increased inclusion through uptake of personalized digital inclusion tools and citizen portals	% of population using personalized digital inclusion tools	10%	Unknown	Sum of DCH users, CRM users, and users of connected community apps.
Immediate and Intermediate Outcomes	Segment Specific Tools	Create self service tools that are intuitive and help people find resources relevant to their needs and reduce barriers	Customers who rate the digital tools as highly satisfactory in connecting to what matters and reducing barriers	75%	0	Develop customer feedback areas within tools
			# of tailored tools per segment	1		Smart City Manager
Immediate and Intermediate Outcomes	Citizen Co-creation	Incorporate user-centred design iterations to improve and deploy technology that reduces barriers and improves access	Customers who provide on-going feedback on the digital tools (CRM portal, connected apps and DCH)	10%	0	Develop customer feedback areas within tools
			End user participation in user-centered design workshops	300	0	User-centred design consultants' reporting
			# of user-centered design iterations	>2/app	0	User-centred design consultants' reporting
Project Activities and Outputs	Connect Data, Ideas and Technology	Deploy technologies for user adoption	User uptake on each new tool	8%	0	Application userbase
			Market penetration for Doorable	50%	0.7%	Doorable
		Improve basic digital access	# of agencies and public spaces with digital access for clients	50	15	Fred-e Zone reporting
		Create personalized inclusion spaces	Number of unique visitors to Digital Community Hub and CRM portals	5000	0	Develop analytics on Digital Community Hub userbase
		Create rich data sets and resources for users and innovators	# of datasets in the hub	TBD	TBD	Digital Community Hub Coordinator reporting
			# of services and programs listed/linked in the hub	TBD	TBD	

Progress Timelines, Deliverables, Milestones and Payment Schedule

The schedule of deliverables and performance milestones with a proposed payment schedule are shown on the following pages. The rightmost column shows the **progress for each performance milestone anticipated at each stage relative to the end-target**. For example, we will develop three empathy-based personas by December 2019, showing progress towards a total target of developing 24 before the end of the five-year period.

Certain deliverables have immediate performance measures within the same timeframe, while others have resulting performance measured in the subsequent period.

Deliverable Milestones	Performance Milestones	Progress and Payment
Complete Citizen Experience Strategy	Empathy based personas	3/24
Complete Digital Talent Strategy	Insightful moments that matter	12/100
Community Digital Hub team established	Segment aspirations and experience analysis	1/8
NPO team operational	Number of installations of Doorable hardware	200/200
Ethnographic research older adults	Number of agencies onboarded to HIFIS4	5/9
Map of the Accessible City	Number of users of digital access at homeless agencies per month	100
Doorable initial deployment		
Road Home Core Infrastructure Installed		
1 December 2019		\$ 1,925,000
Complete Newcomer ethnography	Empathy based personas	6/24
Check-in companion app V1	Insightful moments that matter	24/100
Technology inclusion tools for homelessness	Segment aspirations and experience analysis	2/8
Doorable deployment & dev	Number of user centered design iterations	2
	User uptake as a percentage of segment	8%
	Number of agencies on HIFIS4	8/9
2 June 2020		\$ 620,000
Implemented core Customer Billing	% of customers transitioned to self-serve online accounts	50%
Implement core HR Scheduling	Number of FTE hours efficiency gained	2000
Complete 1 First Nations ethnography	Empathy based personas	9/24
Develop Newcomer technology V1	Insightful moments that matter	36/100
10 NPOs on-board data project	Segment aspirations and experience analysis	3/8
	Number of user centered design iterations	2
	User uptake as a percentage of segment	8%
	Number of user-centered design iterations	2
	First 10 out of 40 NPOs	10/40
	Number of cause based hubs created	3/8
	Number of monthly contributors to the DCH	100/500
	Number of unique visitors to DCH & CRM portals	500/5000
	Market penetration of Doorable on public facilities	50%
3 December 2020		\$ 2,700,000

Deliverable Milestones

Performance Milestones

Progress and Payment

Complete 2nd First Nations ethnography
Develop First Nations technology (a)

Empathy based persona	12/24
Insightful moments that matter	50/100
Segment aspirations and experience analysis	4/8
Number of user centered design iterations	2
User uptake as a percentage of segment	8%
9 agencies on HIFIS	9/9
Reduction in number of duplicate files	TBD
Speed to connect clients to appropriate services	TBD

4 June 2021

\$ 200,000

Implement Talent & Performance Management
Implement Work Management & Field Service
Complete ethnography for youth segment
Develop First Nations technology (b)
Create Doorable online community
Create NPO data and practices toolkit
DCH Release #2 Cultural Connectedness

Increase in customer satisfaction with billing	40% increase
Number of FTE hours efficiency gained	6000
Empathy based persona	15/24
Insightful moments that matter	62/100
Segment aspirations and experience analysis	5/8
Number of user centered design iterations	2
User uptake as a percentage of segment	8%
Number of users on the Doorable application	2000
Next 10 of 40 NPOs	20/40
Number of caused based hubs created	5/8
Number of monthly contributors to the DCH	200/500
Number of issues that have comprehensive analysis using community input	4/14
Number of unique visitors to DCH & CRM portals	1000/5000

5 December 2021

\$ 1,695,000

Complete ethnography business
Develop technology for youth

Empathy based persona	18/24
Insightful moments that matter	75/100
Segment aspirations and experience analysis	6/8
Number of user centered design iterations	2
User uptake as a percentage of segment	8%

6 June 2022

\$ 195,000

Implement CRM
Complete ethnography Seg G
Develop business technology
NPO Data analysis and aggregation
Doorable scale business
DCH Release #3 Economic Inclusion and dashboard

First 2000 hours reallocated to customer relationships	2000/4000
Analysis of top CRM issues in 311 data	10/25
Segment aspirations and experience analysis	7/8
Empathy based persona	21/24
Insightful moments that matter	87/100
Number of visitors to the Digital Community Hub and CRM portals	5000/5000
Number of user centered design iterations	2
User uptake as a percentage of segment	8%
Next 10 NPOs on board	30/40
NPO testimonial reporting using data effectively	10
Number of caused based hubs created	7/8
Number of issues that have comprehensive analysis using community input	9/14
Number of monthly contributors to the DCH	300/500
Number of unique visitors to DCH & CRM portals	2000/5000

7 December 2022

\$ 1,275,000

Deliverable Milestones	Performance Milestones	Progress and Payment
Complete ethnography Seg H Develop technology for seg G	Empathy based persona Insightful moments that matter Segment aspirations and experience analysis Number of segment specific tools deployed Users who rate the digital tools as highly satisfactory in connecting them to what matters User uptake as a percentage of segment	24/24 100/100 8/8 8/8 75% 8%
8 June 2023		\$ 197,000
Implement Customer Portal Develop technology for Seg H NPO data collaboration & community data DCH Release # 4 NPO Community Hub & Community Profile	Next 2000 FTE hours reallocated to customer relationship Analysis of top CRM issues Number of user centered design iterations User uptake as a percentage of segment Next 10 NPOs on board Funding grants supported by data using outcomes as a criteria Number of organizations contributing data to the DCH Number of service collaborations between NPOS Number of cause based hubs created Number of monthly contributors to the DCH Number of issues that have comprehensive analysis using community input Diversity of inputs used in analysis per issue (organizational input, individual input, ethnography, connected technology) Number of unique visitors to DCH & CRM portals	4000/4000 25/25 2 8% 40/40 2 10 10 8/8 400/500 14/14 14/14 <3 5000/5000
9 December 2023		\$ 1,190,000
Interactive Integrated Personalized Inclusion	Number of monthly contributors to the DCH % of residents who are satisfied with services to help them participate fully % of residents captured in 1 or more empathy based personas % of population using personalized digital inclusion tools, DCH and Customer portal	500/500 95% 100% 10%
F June 2024		\$ 3,000
		<u>\$ 10,000,000</u>

Performance Monitoring, Reporting & Evaluation Strategies and Checkpoints

Each project team will report on outcome measures, milestones and payments for the respective project. The Digital Community Hub administration, led by the Smart Cities Manager, will compile and monitor performance indicators monthly and/or quarterly (whichever is more appropriate for the measure), establishing reporting with both internal and external sources of data and sharing the information directly with all projects. Monthly cashflow variance reporting will occur as outlined the financial tools and accounting methods section.

The Smart Cities Manager will bring forward a high-level summary of project performance checkpoints and contingency measures from project monitoring as part of the quarterly progress report to the Task Force (as outlined in *Governance*). The Task Force would suggest course corrections for the project committees if not meeting objectives and a change control process if there are major project deviations.

Performance Measurement Risks and Planned Mitigations

Below are risks and mitigations identified for performance measurement.

Risk	Mitigation
Disproportionately focusing on a few select groups (not representing whole community), preventing a complete community profile	<ul style="list-style-type: none"> Selecting a relatively high number of distinct segments (12), ensuring segmentation represents the entire population so each individual will be able to see themselves represented in at least one segment. Conduct annual surveys to ensure proper capture; ongoing ethnography to identify changing needs, new customer segment profiles/personas, etc.
Lack of people using personalized digital inclusion tools due to privacy concerns and/or of real or perceived value by residents	<ul style="list-style-type: none"> Being clear and upfront about how the data is collected, used, disclosed and protected through a simple consent form and in communications efforts. Using user-centred design principles and stakeholder collaboration to directly involve users/stakeholders at each step (including post-launch) and understand their concerns related to ease of use, privacy, etc. as well as what they value. Develop & regularly update full marketing/communication plan for all projects, with wide range of communication mediums to address concerns about value/privacy. Conduct regular surveys to determine satisfaction, solicit feedback, and identify new and changing needs.
Lack of participation in cause-based hubs, or lack of cause-based hubs	Marketing and awareness efforts; stakeholder engagement via Digital Community Hub Coordinator working with organizations.
Lack of data sets, services, programs to include in the Hub	Research to identify data sets, and stakeholder engagement to onboard new agencies.
<ul style="list-style-type: none"> Inaccurate data sets to feed into Digital Community Hub 	<ul style="list-style-type: none"> Ensure data quality via analyst & hub coordinator. Work with NPOs to establish data standards. Community Hub Coordinator to work with stakeholders to identify issues and recommended fixes.
<ul style="list-style-type: none"> Lack of citizen engagement in co-creation process 	Marketing and awareness and more targeted outreach re: user-centred design.

No measurable change or citizen dissatisfaction with support and services created to increase inclusion	More targeted engagement to increase awareness and/or more in-depth research to better understand needs and gather insights.
Choosing inappropriate metrics to measure improvement	Segmentation research & workshops.
Transformation effort of Digital Fredericton does not make a material impact on organizational behaviours	Launch Transformation Academy to develop leadership skills and gather key feedback and insights about how they can best be supported in their role to be visible and accountable change leaders (e.g. coaching, key messages).
Digital Fredericton stakeholders have not adopted new behaviours, processes, policies, and / or tools	Embracing/adopting new learning modes: micro-learning, self-service, "in the moment", engagement as learning, etc.

Technology

Technology Vision

Fredericton and St. Mary's First Nation will create a modern Smart Cities digital infrastructure capable of responding to an increasingly fast pace of change, providing innovative new user experiences to residents while augmenting our workforces and community service organizations to elevate our human and social capital to new heights.

We will use agile human-centred design practices and a digital mesh of platforms to create a smart city that is open, secure, interoperable and extensible. Putting digital ethics at the core of all we do, our network of interconnected personalized digital inclusion tools and services will be safe, cyber secure, with privacy and transparency built in by design. It will be governed in the public trust with data owned by the public domain.

"It has been an honour to work with the City of Fredericton team over the past two years, as an early client of our pioneering cybersecurity engagement and risk management platform. I have experienced firsthand the skill, vision and passion the City will employ to successfully execute on their proposal. I can also attest to their commitment to cybersecurity, privacy, data and connected technology. As we strive to build the smart cities of tomorrow, ensuring they are secure and respect the privacy rights of citizens is fundamental. Fredericton's commitment to empowerment and engagement for its employees and to continuous improvement in its people, processes, culture and technology is a powerful example for other Canadian municipalities. I can think of no better Canadian city, town or village that embodies both the spirit of innovation and collaboration than the City of Fredericton."

David Shipley | CEO, Beauceron Security

Technology Architecture Guidelines and Principles

The many technology selections, and approaches to development and integration available in the market presents a challenge in reaching and sustaining our vision. The following principles will guide our approach to mitigate the risk of selecting technologies, designs and integration methods in an ad hoc fashion that do not support our vision.

Accessibility and Usability Principles to Support the Uptake and Acceptance of Diverse Users, Residents, and Other Stakeholders

New User Experiences

There is a plethora of smart technologies being released to the market. These allow for new user experiences to be developed. New user experiences will be powered by artificial intelligence (AI) and natural language processing. More specifically Machine Learning to allow for voice enablement of services, as well as using new data sets from embedded sensors, video, and imagery to allow for an increased level of cognitive

computing. Mobile apps will be supplemented with chatbots, conversational user interfaces and intelligent assistants.

We will use insightful moments to deliver more meaningful and personalized experiences. This connection of data, smart algorithms, and insights will lead to deeper and more meaningful interactions sharply tailored to the individual and their situation.

Design Ops

We will combine agile development, dev-ops and design thinking to create design driven engineering or "Design Ops". We will use rapid prototyping to re-engineer outcomes.

Design thinking visualizes the end experience first, then synthesizes the pieces together to achieve, augment and build toward that vision. It is human-centric and iterative.

Design-ops will fundamentally shift user experiences to interfaces that are more intuitive. Design thinking is about adopting a deeply human-centric viewpoint to redefine why and what should be built in the first place. It will refine and then perfect user experiences to create better, more enjoyable productivity – for both residents and service providers.

Augmented Workforce

Technology will not replace the expert. Instead, it will bolster the expert with new insights and data driven knowledge to serve customers better.

To be digital on the customer service side, we must first have digital process inside. We will transform and modernize our workforce including non-profits and service organizations. We will use technology to drive an efficient internal process and use digital talent management to drive customer focus. Technology will achieve new outcomes while simultaneously optimizing core operations.

Rich Data Sets

We will leverage existing, widespread data to gain exponential value from new ecosystems, to generate even more value than the sum of the different pieces, advancing the entire system of service delivery, rather than individual agencies.

This will lead to new learning about how to partner and crowdsourcing innovation to solve problems by going beyond traditional organizational and digital borders to benefit from the knowledge of people who would not normally interact.

Guidelines for Future-Proofing the Technologies

Interoperability

Interoperability is imperative in sustaining a smart city solution that will be very heterogeneous in environment, both in terms of present and future state.

These systems encompass many layers from communications, data interfaces, service interfaces, and user interfaces like voice and IoT devices. Interoperability of systems ensures they can exchange and make use of information.

We will create a dynamic mesh that seamlessly connects people with things, algorithms, data, and future innovations, with digital personal assistants, automated agents, and other entities. Application and data interfaces will connect many systems and data sources to leverage the power of multiple platforms.

Extensibility

A key component of any smart city solution is to ensure the solution developed and implemented takes future growth into consideration. While this may seem like trying to predict the unknown, we will follow best practices to “Future Proof” the solution. Those include using loose coupling of solutions in a service-oriented manner so continued development can occur even if not all requirements are known at the onset. Taking an Agile approach to solution development will also facilitate extensibility.

Interoperable and extensible platforms create opportunities for multiple meaningful engagements for residents and enable partners to take advantage of a “mesh of interactions” and future technologies that connect to legacy data.

Access to shared data and access to add on to systems and add new features using service-oriented architecture will create solutions that are flexible enough to use in new ways that are not yet known. This will allow others to extend existing solutions in innovative new ways we have not thought of.

Scalability

In the spirit of future proofing a solution, we must ensure it will scale in many different ways including volume of data, number of users, and types of usage. Cloud based computing will be a key resource to assist with this in that it supports auto scaling of resources. We realize that might not come automatically, but wherever possible we will look for solutions that are delivered in a secure Software as a Service model (SaaS). Any solution developed will utilize cloud native resources and tools that support auto scaling.

Legislative, Regulatory and Ethical Principles

Digital Ethics

Ethics is more than just what is legally required for compliance; given what is possible through technology, it is creating that which is morally desirable. With AI and big data, the digitization of everything, and our extended ecosystem, the potential impact of secondary and unintended consequences is greater and harder to predict than ever before.

Every digital action can have an equal and potentially unintended secondary consequence and decisions we make about our digital experiences are particularly

significant. From personal data and privacy protection, to compliance, trust and responsibility, ethics has never been so important.

We will address issues like data security, trust and privacy with guidelines of how data should be obtained and used. We will demand digital ethics from all participants who must adopt digital ethics and act with responsibility, transparency, compliance and privacy.

We will educate stakeholders on what is possible, how data is being used, and on threats and security considerations. We will manage data interactions from other repositories, establishing data sharing agreements and secure technologies to share data between platforms.

Security and Privacy by Design

Given the ever-increasing threat of cybercrimes, and the legislative requirements within the New Brunswick Right to Information and Protection of Privacy Act, we will ensure all solutions are designed with security and privacy as a foundation. This includes securing data at rest and in transit, least privilege access as well as robust monitoring and auditing. It also includes leveraging cloud native development platforms where the traditional security vulnerabilities do not exist.

Systems will be designed for privacy and security using upfront analysis, and designs that facilitate regular privacy and security assessments, reviews and audits. Designs should include audit logs that can be routinely monitored and analyzed.

Technology Standards, Architectures, and Initiatives

Developing a Smart Cities technology that seamlessly connects people to what matters most requires definition of elements at every layer of the data collection and information management process. Definition of the specific standards used for integration allows for the interoperability principle to be achieved. Each element shown in the following technology architecture is commercially available and easily deployable. Following this architecture and the guiding principles will allow for replicability and scalability.

An overall architecture is defined that includes sensors and edge devices, networks of WiFi, low powered radio, cellular, and fibre networks connecting to secure data storage platforms and linking to advance computing algorithms within a service-oriented architecture to create smart user experiences.

This Smart Cities proposal builds on a multi-cloud approach using hosted applications, on-demand infrastructure, and micro-services. In 2018, the City of Fredericton successfully launched SaaS applications for core Financial and Human Resources Management on the Oracle cloud with authentication and application interfaces using ADFS services and SOAP webservices hosted in the Microsoft Azure cloud.

The City of Fredericton has an extensive geographical information system (GIS) and open data portal already built on Esri ArcGIS. The Digital Community Hub will extend these existing resources to deploy new community-based features and services.

Fredericton was one of the first municipalities in North America to build a community fibre network and offer free Public WiFi. Several hundred kilometers of fibre connect the city.

The City recently partnered with technology company eleven-X to pilot a new LoRaWAN IoT sensor network which is now operational and available to the community.

Our ecosystem has grown substantially over the past year and has attracted both technology partners with specialized skills, academic researches, and social innovators building technology solutions that are important and useful to people who live in our City.

Interoperable Open Architecture for a Smart City

Layer	Object	Technology
Intelligent Adaptive User Applications	Enterprise core applications	Oracle ERP, Human Capital, and Work Management
		MS Dynamics 365 CRM
		HIFIS 4
		ESRI Geographic IS
	Digital Community HUB	ESRI ArcGIS Community Hub
	Connected community applications	Doorable
		LiveKool Check-in
		Hullo & Future Development
Smart Algorithms and Microservices	Serverless computing	Amazon S3, AWS Lambda
	Identity management	AD B2C, Cognito
	Access and authentication	MS ADFS
	Recommendation engines	Amazon Personalize
	Chatbot and voice recognition	AWS Lex
	Machine learning	SageMaker on AWS
	Computer vision	Amazon Rekognition
Service Oriented Architecture	Web Services	SOAP
	Application Programming Interfaces	JSON REST APIs
	IoT device data brokering	MQTT
Infrastructure and Storage	Database storage	AWS RDS and S3
	Open Data	ESRI Open Data Hub
	Secure data storage and analytics	NBIRDT
	Cloud backup	MS Azure Blob
	Infrastructure and servers	MS Azure, AWS EC2
Network	Municipal fibre network	F6 Networks
	Public WIFI	e-Novations
	Cellular 4G, 5G	Rogers
	Telemetry IoT network	LoRaWAN by eleven-X
	Security monitoring	IBM Q-Radar
Edge Devices	WIFI Access Points	Fortinet
	Cameras	Cisco
	Smart water meters	eleven-X
	Digital displays	Samsung
	Urban telemetry sensors	LoRaWAN IoT protocol

Technology Partnerships and Collaboration

Open integrated architecture creating a digital mesh of interactions requires an open and integrated collaboration of technology partners.

One key partner, Deloitte, started with us on our journey, supporting our vision to digitally transform. Our strategic relationship with Deloitte includes a combination of project support, in-kind contributions, and general transformation management activities that will span core, e-government (customer experience) and connected community strategies, with designs and implementations. The relationship is likely to evolve over that timeframe, given the rapid pace of technological and other change that will occur.

A strong partnership, with a unified team focused on delivering value to our community through innovation, is able to build and sustain a strong innovation ecosystem and community.

"We are proud of the milestones that the City and Deloitte have achieved together thus far. We are also thrilled to have the opportunity to continue to collaborate, along with community groups, Oracle and other private companies, and others to achieve the Digital Fredericton aspirations of improving quality of life and driving economic prosperity. We are confident that together, an ecosystem will mature to fundamentally change the way the City works and interacts with its citizens."

Greg MacQuarrie | Partner, Deloitte

Roles and Responsibilities of Technology Partners

Deloitte – Transformation leadership and visionary support; Core systems implementation Oracle Cloud Integration; global perspectives and Smart Cities insights

Blue Spurs – Technology Innovation leadership; Adaptive Smart Application extensibility to other digital systems; serverless application development for connected applications; technology support for Civic Tech Fredericton; adoption and implementation of AWS smart algorithms; innovative edge devices with smart algorithms

Bulletproof – Cybersecurity monitoring using IBM Q-Radar and security operations centre; threat hunting and risk assessment; training and development of cybersecurity workforce

Civic Tech Fredericton¹ – Technical learning, volunteer and collaboration opportunities for developers and social innovators; analyze and visualize data and develop applications and microservices to provide technical solutions to social issues for non-profit agencies;

¹ The City of Fredericton works together with Blue Spurs to provide AWS cloud infrastructure and microservices to Civic Tech Fredericton. Volunteers from Blue Spurs provide training and leadership in building advanced applications based on AWS cloud technology. www.civicttechfredericton.com

develop social applications on the AWS platform, using low cost and scalable infrastructure.

eleven-X – Engineering, support and delivery of public IoT network using LoRaWAN; supply urban sensors and build out smart city telemetry devices and data; provide smart city sensor data through Open Data Portals and APIs.

Esri Canada Ltd. – Expertise in geographic information systems; in-kind support and development of the Digital Community Hub.

F6 Networks – Maintain and extend Fredericton's metro fibre infrastructure; provide gigaburst, high bandwidth internet connectivity.

NBCC-NSERC Industrial Research Chair in Mobile First Computing – Provide applied academic research in immersing UX design.

Rogers – Innovation investments in Fredericton; provide LTE networks for IoT extensions; provide data connections on municipal transit to enable public WiFi.

Results of Testing and/or Piloting in Finalist Phase

To prove out development methods, guiding principles and technologies, many of the technology architectures have been used by the City in production environments or prototyped with pilot projects during the finalist phase. The links below are to working prototypes or minimum viable products. Please visit www.fredericton.ca/smartcity for more information about these prototypes with video content and latest developments.

Doorable (minimum viable product, version 1.0):

<https://play.google.com/store/apps/details?id=com.appdigenous.doorable>

(also available on the Apple App Store)

Digital Community Hub (prototype of features and functions):

<http://fredericton-dashboard-fredericton.hub.arcgis.com/>

Velocity CRM Portal (functioning pilot, integrated with back-end systems, not publicly launched): <https://cof.microsoftcrmportals.com/en-US/submit-a-service-request>

Hullo (prototype setup for android device):

<https://drive.google.com/drive/folders/11EvGboyBSSwi08f-RxILmKaJFLrnQVAo?usp=sharing>

LoRaWAN Telemetry IoT network (pilot project using parking sensors):

<https://demoapp.eleven-x.com;>

User Name: fredericton.parking@eleven-x.com , Password: parking

Companion Check-In and Online Community Support Tool (prototype used for market testing): <http://livekool.com/nonprofit>

Real-time Data integration of IoT LoRaWAN network with Digital Community Hub (MQTT and JSON APIs protocols for interoperable application and data integration):

<http://how-are-we-doing-fredericton.hub.arcgis.com/>

"Shortly after we started working with the City of Fredericton, it became apparent that this is not your average city. First, they already had an impressive amount of Smart City infrastructure in place. Specifically, they had their own fiber network, city-wide Wi-Fi, and an impressive operational open data platform. In addition, they were already working with a local company to develop a smartphone app to help people with accessibility issues. Impressive for any city of any size, in my humble opinion. Second, they move at lightning speed compared to any other city we have encountered. For example, the RFP was issued in September and awarded in October, our network was deployed several weeks after that and the in-ground parking sensors were installed shortly after that. In around three months they went from initiating the RFP to getting real-time parking data. Third, they listened to their community to find out what is important to them, structured their Smart City Challenge Statement around that, and found an innovative way to address the challenge with technology. The first parking spots that Fredericton choose to monitor are the accessible parking spots. The data is being fed into their existing open data platform and from there into the accessibility parking app I mentioned earlier. Fourth, in case it is not obvious, Fredericton is willing to take risks and be early adopters. I can tell you this is very uncommon for cities, but it is a fundamental and often overlooked ingredient required to truly achieve innovation."

Ryan Hickey | COO, eleven-X

Technology Risks and Planned Mitigations

Risk	Mitigation
Digital tools/platforms/apps are not user-friendly	Employing user-centred design workshops/usability testing throughout ideation/prototyping/development stages as well as post-launch.
Personal Privacy	Annual privacy audit, PIA and guidance, governance subcommittee.
Cybersecurity	Monitoring, threat assessments and threat risk assessments from Bulletproof Security Operations Centre using IBM Q-Radar appliance.
User acceptance and usability	Iterative user-centred design, reporting on monthly users.
Workforce efficiency	Lean 6 Sigma reporting to performance subcommittee.
Interoperability	<ul style="list-style-type: none"> Develop and document an integration strategy that defines the service-oriented architecture and interface protocols to be used, and the application service end-points. Publish the documentation on the Open Data portal. Maintain a central library of documented system interfaces and with subscriber list.
Knowledge gaps	Create networks of systems experts through Civic Tech and business partners, hire staff with existing skills, train internal staff on new protocols.
System architecture – the current infrastructure is not ready to build out a project of this magnitude.	Review and update internal architecture in parallel. Understand the implications of lack of infrastructure readiness on organizational success and team adoption.
Abandoned platforms HIFIS-Feds; NB-IRDT, NPOs	<ul style="list-style-type: none"> Federal housing agreement renewal, NBIRDT agreement renewal. Maintaining relationships among adopters.

Governance

Governance Frameworks and Strategies

The Smart Cities Program and the initiatives and projects in this proposal will be governed by the Fredericton Smart Cities Task Force comprising 15 members outlined below representing a broad community of interests. Meetings will be held quarterly. The Task Force's primary role is an advisory one with respect to the overall progress of the Smart Cities Challenge and its five projects. Reporting will be by way of quarterly progress reports furnished by the Smart Cities Manager, which will include projects' progress, marketing/communications/engagement and budget. The Task Force will provide input with respect to issue management, mitigation strategies, change control process if there are major project/cost deviations, and ensuring data, security and legislative compliance requirements are executed (including an annual privacy audit).

Fredericton Smart Cities Task Force Composition:

1. Fredericton Smart Cities Task Force Chair
2. St. Mary's First Nation designate (ex-officio)
3. Smart Cities Manager (ex-officio)
4. Fredericton City Clerk / Privacy Sub-Committee Chair (ex-officio)

Five Project Committee Leads representing:

5. Non-Profit Data Collaboration (Greater Fredericton Social Innovation)
6. Road Home Digital Platform (Community Action Group on Homelessness)
7. Digital Community Hub (WSP)
8. Doorable (Appdigenous)
9. Digital Fredericton (City of Fredericton)

Academic, Commercial and Social Oversight:

10. University of New Brunswick
11. New Brunswick Community College
12. Fredericton Public Library
13. Rogers
14. Blue Spurs
15. Deloitte
16. Fredericton Community Foundation
17. Stan Cassidy Centre for Rehabilitation
18. Hotspot Inc.
19. Ignite Fredericton
20. United Way

Friendship Accord

This governance structure has representation from City of Fredericton and St. Mary's First Nation. Building on this governance structure, the two communities intend to enter a Friendship Accord. The Friendship Accord is a framework for mutual governance of broader community issues of mutual interest.

A Friendship Accord “creates the opportunity to outline why and how two (or more) communities would like to build and sustain their relationship over the long term [...] to:

- strengthen the relationship and provide a framework to undertake joint work
- provide structure, although this not a legal document or a business agreement
- inspire and guide the long-term relationship
- celebrate with the broader communities and regional partners
- formalize the spirit, intent and cooperative agreement of the partnership.”²

Program Administration

The Fredericton/St. Mary's Smart Cities Challenge initiative will be managed by the **Smart Cities Manager**, who is responsible for:

- Managing the Digital Community Hub administration and staff (including the Digital Community Hub Coordinator, Data Analyst, and Hub Content Creator; see “Human Resource Requirements in *Project Management*).
- Liaising with project committees to facilitate the successful implementation of projects.
- Managing budget oversight, and funding disbursements to the five projects.
- Reporting to Infrastructure Canada.
- Coordinating quarterly Fredericton Smart Cities Task Force meetings including report generation (quarterly progress reports, budget, issue management).
- Managing strategic marketing and communications for the Smart Cities Program as it relates to Fredericton's brand. This includes the development of an integrated marketing communications plan (encompasses the public awareness element/storytelling, leveraging partnerships with respect to marketing, public relations, refreshing GoFred brand, elevating Digital Fredericton brand, etc.).
- Cultivating and fostering stakeholder relations/partnerships.
- Managing Smart Cities Innovation Lab, and liaising with potential and existing entrepreneurs as it relates to Smart Cities app development – connecting them with partners/staff and funding.

Privacy

There will be a Smart City Task Force Privacy Sub-Committee – chaired by the CoF Chief Privacy Officer (City Clerk) or his/her designate and will be comprised of representatives

² “Relationship/Friendship Accords.” CEDI. Cando. <http://www.edo.ca/cedi/relationship-friendship-accords>

from each of the five project committees, plus a representative from St. Mary's First Nation, a privacy subject matter expert, Virtual Chief Information Security Officer/Bulletproof Security Operations Centre, and a representative each from NB-IRDT and Service Canada. The Committee will be responsible for developing privacy frameworks and their privacy policies, procedures, protocols, consent forms and data sharing agreements as necessary and submitting them for approval to the Task Force. The Privacy Sub-Committee would ensure an annual privacy audit.

Financial Oversight

Funding received from Infrastructure Canada will be disbursed by the City of Fredericton. The Smart Cities Manager will be responsible for maintaining the budget and funding disbursements based on allocations as per the Smart Cities Challenge submission. Quarterly reports – or prescribed reporting format as per Infrastructure Canada requirements – will be presented to the Task Force by the Smart Cities Manager to inform of progress and deviations which could result in change control.

Digital Fredericton Program & Project Governance

Due to the magnitude of the Digital Fredericton initiative, a **Program Level Leadership Team** will be assigned to the Digital Fredericton Transformation. The Leadership Team is made up of leaders across the City of Fredericton's lines of service and relevant Deloitte service lines and responsible for planning, priority setting, overseeing and delivering against the commitments inherent to achieving the Digital Fredericton vision. Each Digital Fredericton project will be governed by a project charter and statement of work when it involves partnering with external partners. Each Digital Fredericton project will have its own project team, with projects of significant size and scale including the following elements: Project Steering Committee; Executive Sponsor; Project Manager; Project Subject Matter Experts; Project Team Members; Change Management Team; Technical Leads (where appropriate); other roles defined as appropriate.

Project Committees

The five project committees (Digital Fredericton, Digital Community Hub, Doorable, Road Home Digital Platform and Non-Profit Data Collaboration) will comprise:

- **Project Lead** – Setting and managing direction and overall project deliverables.
- **Subject Matter Experts** – Providing insight and subject matter expertise and support.
- **Team/Project Resource Support** – Providing team support, assistance and resources to support the project including administration, maintaining budget, reporting, etc.
- **Creative Lead** – Innovating and pushing the team to advance outcomes through creative thinking.
- **Additional Resources** – as deemed appropriate by the project lead.

The committees will be responsible for setting their meetings and their project plan deployment (including maintaining project schedule, budget), monitoring/controlling outcomes as per set performance measurements to receive funding disbursements, managing risks, partnerships, recording minutes and providing quarterly report inputs to the Smart Cities Manager regarding project progress and budget.

Role, Capacity and Partner/Stakeholder Readiness

Role	Organization & Contact		Impact/Influence & Capacity/Readiness
Co-Applicant	Mike O'Brien <i>Mayor, City of Fredericton</i>		Municipal decision-making on behalf of City Council Fully committed to the success of this initiative providing significant human and financial resources.
Co-Applicant	Alan Polchies <i>Chief, St. Mary's First Nation</i>		SMFN decision-making on behalf of Band Council Fully committed to the success of this initiative providing First Nations oversight.
Digital Fredericton Transformation Partner	Greg MacQuarrie <i>Partner, Deloitte</i>		Long-term strategic partner investing \$1 M to date in helping to achieve the Digital Fredericton vision.
Technology provider	Alex Miller <i>President, Esri Canada Limited</i>		Provided over \$50,000 in technology and supporting services to develop the Digital Community Hub prototype. Committed to provide \$20,000/year in professional services to further support the development of the Digital Community Hub.
Digital Community Hub Research & Data	Dr. Jeff Rankin <i>Dean of Engineering University of New Brunswick</i>		Provided comprehensive research on smart city indicators and data sets to include in Digital Community Hub.
Digital Community Hub Project Management	Dr. Anna Robak <i>Research Manager, Innovation & Future Ready, WSP Canada</i>		Provided in-kind project management services for the development of the Digital Community Hub.
Innovation Partner	Troy Harnish <i>Rogers</i>		Providing in-kind services to support Fredericton's innovation/Smart Cities agenda.
Innovation Partner	Ryan Hickey <i>eleven-X</i>		Supporting Fredericton's smart cities agenda to deploy/operate LoRaWAN wireless IoT network to enable future application development. Eleven-X is contributing half the cost of the next 1000 network connections – valued at \$12,000.
Innovation Partner	Mike LeBlanc <i>CEO, Blue Spurs</i>		Providing strategic innovation oversight with respect to the Smart Cities Challenge projects.
Smart City Task Force / Project Committee Members	Project Leads Digital Fredericton – Valerie Kelly Digital Community Hub – Anna Robak Appdigenous – Melissa Lunney Non-Profit Data Collaboration – Sandi MacKinnon Road Home Digital Platform – Faith McFarland		These organizations/ representatives have been selected based on their unique contributions, capacity and subject matter expertise to impact the success of projects.
User-centred design provider	Greg Phillips & Chelsea Wilson <i>Accreon</i>		Providing in-kind user-centred design valued at \$1500 for the Digital Community Hub.
Road Home Platform Early	Warren Maddox <i>Fredericton Homeless Shelters</i>	Julia Galant Daigle <i>Youth in Transition</i>	Partnering to pilot/adopt new HIFIS4 shared client management platform.

Adopters of HIFIS4	John Barrow <i>John Howard Society of Fredericton</i>	Lisa Edwards <i>Capital Region Mental Health & Addictions</i>	
Doorable Early Adopters	James Blanchard, <i>City of Fredericton</i>	Sally Brooks <i>St. Mary's First Nation</i>	The City of Fredericton and St. Mary's have committed their readiness as an early adopter of the technology, and to conduct user testing. Two for-profit organizations have come on board as private sector adopters.
	Tim Woods <i>Brookside Mall</i>	Larry Shaw <i>Knowledge Park</i>	
Non-Profit Data Collaboration Early Adopters	Sandi MacKinnon <i>GFSI</i>	Alex Boyd <i>Greener Village Food Centre</i>	Betty Daniels <i>Meals on Wheels</i>
	Jess Baxter <i>Alzheimer Society of New Brunswick</i>	Fiona Williams <i>Liberty Lane</i>	Julia Gallant <i>Daigle Youth in Transition</i>
	Christin Swim <i>Skigin-Elnooog Housing Corporation</i>	Erica Young <i>Opal Family Services</i>	Jan Wambolt <i>Wil-Doo Cycle</i>
	Karen MacAlpine <i>Fredericton Boys & Girls Club</i>	Fiona Williams <i>Partners for Youth</i>	Julia Stewart <i>Fredericton Library</i>
Non-Profit Data Collaboration Support Partners	Karina LeBlanc <i>NB Social Policy Research Network</i> <i>Pond-Deshpande Centre</i>		Strategic support partner.
NPO Data Infrastructure	Dr. Ted McDonald <i>Director, NB-IRDT</i>		Key partner of the NPO Data project equipping NPOs with tools, enabling the transfer of aggregate data to connect with provincial data infrastructure.
NPO Data Support	Dr. Jules Maitland <i>Co-Founder, Civic Tech Fredericton</i>		Supporting the NPOs on how to link data sets, utilize visualizations tech, perform analysis for better decision making, and design tech solutions to address social issues.
NPO Data Standards Coordination	Sarah Campbell <i>Research Manager, NB Social Development (Social Pediatrics)</i>		Funding \$80,000 Data Standard Specialist to develop standardization for NPO project.
HIFIS4 support	Randy Hatfield <i>Saint John Human Development Council</i>		Funding part-time HIFIS Coordinator to onboard and coordinate HIFIS4 deployment valued at \$35,000.
AbilityNB	Haley Flaro <i>Executive Director</i>		Provincial organizations for persons with accessibility challenges/Appdigenous partner.
NBCC	Dr. Marilyn Luscombe <i>NB Community College</i>		Provincial community college network and integral Appdigenous partner.

Please refer to attached supporting documentation for the aforementioned partnerships and other letters of support. Please see the proforma budget in *Financial* outlining the value of in-kind contributions/financial arrangements.

Retaining Community Control Over Sensitive & Personal Data

Individuals of the community will be the rightful owners of their own personal information. (See *Data and Privacy* for more detail.) Community ownership of aggregate or de-

identified personal information through the Digital Community Hub will be the hallmark of the partnerships between the City of Fredericton's initiatives and others undertaken as part of the Smart Cities program. Decisions about community aggregate data availability will flow through the Fredericton Smart Cities Task Force. As well, the OCAP principle (Ownership, Control, Access, and Possession) will be the guiding principle of all personal and aggregate data obtained through the partnership with St. Mary's First Nation.

Governance Risks and Planned Mitigations

Risk	Mitigation
Breakdown in collaboration between the City of Fredericton and St. Mary's First Nation due to diverging priorities	<ul style="list-style-type: none"> • Continue to focus on developing the Friendship Accord • Regular joint briefings between City and St. Mary's elected officials and staff
Keeping stakeholders engaged in the governance process and fulfilling their oversight responsibilities	<ul style="list-style-type: none"> • Set expectations with Task Force members through written roles, responsibilities and expectations of task force members • Semi-annual survey of Task Force and committee members on their satisfaction and effectiveness of the governance process.

Data and Privacy

The personal privacy issues for the initiatives and projects in this proposal are as complex and challenging as the overall endeavour is ambitious, innovative, and entrepreneurial. An in-depth focus on cybersecurity and privacy will be incorporated across all layers of the Digital Fredericton transformation.

Principles

The Fredericton Smart Cities Task Force's Privacy Committee has committed to the following 10 principles to serve as signposts as it moves to ensure privacy compliance for each project: **Respect; Anonymization; Control; Necessity; Consent; Community Ownership; Consultation; Access; Transparency, Accountability, and Open Government; Security.** See a complete description of the 10 Privacy Principles at www.fredericton.ca/smartcity.

Preliminary Privacy Impact Assessment

To address the privacy issues, a preliminary privacy impact assessment (PPIA) was completed by Robert P. Doherty Access and Privacy Services (RPDAPS). Mr. Doherty has almost 25 years' experience in information access and privacy including ten years as an information access and privacy consultant and lawyer. His approach to developing and preparing a privacy impact assessment is one of common sense and attention to detail in rooting out the privacy risks of any project according to the Canadian Standards Association (CSA) ten fair information/privacy principles and relevant legislation and to provide realistic mitigation strategies that address the privacy compliance risks. As part of the development of the PPIA, the Office of New Brunswick's Integrity Commissioner was also consulted and was provided with a copy of the draft PPIA with a request for comment. Adjustments were made to the PPIA and its related materials based on the feedback received from the Office.

The PPIA examined each of the initiatives/projects according whether at this point they were compliant with each of the ten CSA privacy principles and relevant privacy legislation.

Privacy Compliance

Our ambitious proposal creates privacy challenges for each of the projects it encompasses as they not only encounter four applicable privacy laws, but also involve organizations with varying degrees of familiarity with privacy principles and use of privacy management tools. The relevant privacy legislative obligations for the main initiatives/projects are:

- Digital Fredericton & Digital Community Hub – New Brunswick Right to Information and Protection of Privacy Act (RTIPPA)

- Doorable (Appdigenous) – Personal Information Protection and Electronic Documents Act (PIPEDA)
- Non-Profit Data Collaboration – RTIPPA and the Personal Health Information Protection and Access Act (PHIPA)
- Road Home Digital Platform – PHIPA and the Federal Privacy Act

The PPIA has taken into account the privacy obligations of the relevant legislation on each project, **reviewing and assessing the privacy compliance requirements of the ten Canadian Standards Association Fair Information/Privacy Principles each project** as well as the projects overall with respect to:

- the seven principles of Privacy by Design developed by Dr. Ann Cavoukian, former Ontario Information and Privacy Commissioner
- the letter sent to the Minister of Infrastructure Canada from the Information Commissioner of Canada and the information and privacy commissioners or their counterparts across jurisdictions in Canada.
- input from the Office of the New Brunswick Integrity Commissioner responsible for the New Brunswick Right to Information and Protection of Privacy Act (RTIPPA) and the New Brunswick Personal Health Information Protection and Access (PHIPA) Act.

The PPIA also sets out the ten privacy principles set out by the Fredericton Smart Cities Task Force's Privacy Sub-Committee.

Applicable provisions in the relevant legislation are expressed in each of the 10 privacy principles and are assessed in the privacy impact assessment.

Essentially the proposed data management plan is comprised of two major components:

- a privacy management framework for each project
- an information technology infrastructure and security plan and/or policy for each project

The PPIA indicates that for most projects, with the exception of Non-Profit Data Collaboration and Road Home Digital Platform, the security plan for the IT infrastructure that will be used to facilitate is in its formative stages. The exceptions are the IT infrastructure that is already in place at NB-IRDT and the Department of Health for Non-Profit Collaboration and the HIFIS4 System developed by Service Canada. The data provided to both of these organizations by non-profit organizations and homeless serving agencies will be collected securely through the IT infrastructure of these organizations, and will be housed on secure platforms there as well.

As well, there is little in the way of privacy management frameworks and the organizational tools, policies, procedures, and protocols for all projects and participating agencies. The exceptions are Non-Profit Data Collaboration and Road Home Digital Platform. Although non-profit organizations and homeless serving agencies participating in these projects appear to have limited familiarity with the need for such frameworks, their project partners (NB-IRDT, N.B. Department of Health for the Non-Profit Data Collaboration Project and Service Canada with its HIFIS4 System for the Road Home Digital Platform project) appear to have robust privacy frameworks for protecting the personal data they will receive as part of the project.

The full data management plan for all projects will be created in accordance generally with the ten CSA privacy principles' requirements, and specifically in compliance with the provisions of the relevant legislation for each project. Thus, the requirements of the following pieces of legislation are the basis of the privacy assessment for each principle, and the mitigation strategy recommended alleviating and minimizing privacy risks:

- the Right to Information and Protection of Privacy Act (RTIPPA) for each principle for Digital Fredericton, Digital Community Hub, and Non-Profit Collaboration;
- the Personal Information Protection and Electronic Documents Act (PIPEDA) for Doorable;
- the Privacy Act for Road Home Digital Platform; and
- the Personal Health Information Protection and Access (PHIPA) Act as well for Non-Profit Collaboration and Road Home Digital Platform.

The need for such a data management plan is reflected in the legislative obligations that apply to each project. The provisions that apply to determine the specific privacy compliance obligations under each principle in each piece of legislation are not identical. However, there is enough similarity among the different provisions in each relevant privacy law and the CSA privacy principles, except areas such as data matching and common or integrated service delivery, to base the obligations on the applicable principle. Because the obligation in each CSA principle is reflective of the similar legislated obligations for each principle, this was the basis, with the exception noted, of the privacy assessment and will be the basis of the data management plans developed for each project in implementing the mitigation strategies for each project. In short, the data management plans will be compliant not only with each CSA principle, but also to the specific legislative requirements of the relevant privacy laws. The only differences will be in the degree of detail that is required in each law.

Types & Methods of Data Collection, Use, Retention and Disclosure

Personal information will primarily be collected from residents through online engagement, service use (e.g. Doorable), and dialogue. The ethnographic research will collect personal information through online one-on-one video recording and notes made by session facilitators. Other personal information collected by other projects will be done through data entry, either by project representatives or citizens engaging in online dialogue with project representatives.

The personal information will, where possible, be aggregated and de-identified and provided to the City of Fredericton for analysis, policy development and assessing service performance and determining overall service delivery needs or approaches for citizens. Personal information will be, according to the legislative authority relevant to each project, retained according to retention and destruction schedules consistent with the Municipal Records Authority (MRA), NB-IRDT, the New Brunswick Department of Health, and the federal government, and future record retention policies that are expected to be developed by the Government of New Brunswick.

The total life cycle of the personal information collected on all projects will be consistent with these policies, but as noted above, apart from the City of Fredericton and the data

life cycle policies that are part and parcel of NB-IRDT and Service Canada, there will be a need to provide resources for the development of such policies.

Security and Privacy Considerations

From the beginning, privacy and security considerations, particularly those of the seven principles of Privacy by Design, have been and will be dominant in the development of IT infrastructure that will serve each of the projects. The City of Fredericton, in particular has already in place robust privacy and security protections built into its existing infrastructure. Plans for additional IT infrastructure, as noted in Appendices D & E of the PPIA also will include industry standard privacy and security features to protect personal information. In the initial engagements with citizens, there was little if any privacy and security concerns raised as the focus was initially on designing a vision for the future of a city that epitomized a future digital Fredericton that connected and provided services that meet the needs of the citizens of the city most effectively.

Adhering to Principles

Governance

A proposed governance structure has been developed for this initiative that recognizes the homogeneous participation in each project at all levels. Thus, project leads, technical, academic, social innovation, and privacy expertise will be part and parcel of the decision-making process as projects roll out their programs. As well, there will be a privacy checkpoint for all projects that will review progress in the development of the various mitigation strategies designed to ensure privacy compliance with the ten CSA Privacy principles and relevant legislation. A commitment has also been made to engage with residents about the plans for each project prior to each project becoming fully operational, including how their personal information that they provide in the implementation of each will be protected.

Ownership and Control

The concept of community ownership of aggregate data and individual control of personal data through the use of well-structure informed consent forms, and audits of collection, use, and disclosure of personal information on each project is important. It has been and will be dominant through the planning and implementation process for the overall initiative. It is also the intent and goal to provide as much relevant open aggregate data through the Digital Community Hub open online portal. This will not only allow reporting on the progress of each project attaining its goals, but also in providing aggregate data and analysis that encourages economic development in the community. As well, the project recognizes and will implement the First Nations Information Governance Centre Principles of Ownership, Control, Access, and Possession (OCAP) in dealing with personal and community based aggregate information of St. Mary's First Nation, a full partner in the Smart Cities initiative.

Consent

Consent will be the hallmark of each project in requesting citizens to provide their personal information in identifying their service needs and to engage in dialogue with the City. While at this point, there is a variety of consent forms, or no consent form at all for some projects, the future will be marked by use of a solid informed consent form that provides specific information about the purpose of collection, the limits on future use and disclosure, and the retention periods and security protecting personal information they provide. Residents will have the option to opt-out of consent at any time, in accordance with the consent principle developed. For more information, refer to the PPIA, section 8c "Consent" on page 38.

A solid consent form guidance document with a template that can be adjusted to the uniqueness of each project has been prepared for use by each project. As well, to encourage projects to limit their collection of personal information only to that information that is necessary for the effective delivery of the project, a draft data collection template has been developed for use by each project.

Data Minimization and De-Identification

All Smart Cities Challenge projects will retain personal information only within their IT infrastructures for use to deliver services to client or user base. Some de-identification will be possible (and would be done at the earliest opportunity where appropriate) through the use of unique numerical identifiers for this data. However, on the whole, the identifying information will continue to be needed for providing effective services, or confirming identity. For disclosure outside of the individual projects, all personal information will be aggregated or de-identified. This will provide snapshots of the effectiveness of particular services as well their progress in meeting service delivery goals and where appropriate will enhance the data sets on the Digital Community Hub. Other uses would include being able to map an "accessible" city in the use of the Doorable app for the accessibility community, particular research projects through NB-IRDT through data obtained through the "Crosswalk" process, and service delivery analysis for the Road Home Digital Platform. This will all be done by developing appropriate software or approaches to aggregating or de-identifying data with appropriate privacy protections within each application.

Accessibility

At the heart of the initiative is the Digital Community Hub, which will be used as a conduit to providing meaningful data on an open government online portal. This should encourage development of improved service delivery options, real time census data, and economic development and entrepreneurial innovation. This goal will be achieved through open source data gathered by City of Fredericton researchers, and aggregated data from most of the Smart Cities projects. In particular ethnographic research, feedback from accessible app users of Doorable, and aggregate data from the Road Home Digital Platform with respect to homeless individuals will also be used. The Digital Community Hub is the portal and the community engagement sessions that will encourage dialogue

about different approaches and economic development opportunities will be one of the key mechanisms. These mechanisms will take the informational seeds on the Digital Community Hub and provide opportunities for them to grow in fertile environments.

Security

As noted earlier, the information technology infrastructure for the majority of projects (Digital Fredericton, Digital Community Hub, and Doorable) is still in the conceptual or early development stage. However, in the course of providing information for assessment in the PPIA, these projects have discussed or provided evidence of concrete plans to incorporate industry standard privacy and security features in the development of information technology infrastructure for the project. The test ultimately will come when a final privacy impact assessment examines the degree to which these features have been included. Non-Profit Data Collaboration and Road Home Digital Platform, based upon documentation reviewed for these projects, have acceptable privacy and security features in their information technology infrastructure resident in NB-IRDT and the HIFIS4 Platform.

Open and Big Data Strategies

At the heart of this proposal is the objective of capturing a real-time snapshot of the city and its citizens and determining their program and service needs, and the current capacity to address those needs physically and socially. Existing data sets from national counts or surveys, or no data sets at all, are inadequate to provide that determination either because of time lags, privacy, or no data at all because marrying needs with physical, social, and geographic access has been difficult.

While each of the projects will collect and retain personal information of residents to improve personal experiences with programs and services, that personal data will be de-identified or aggregated as well. There are privacy risks and challenges in that overall process that require mitigation strategies as noted in the PPIA. But there are also tremendous opportunities to address that data deficit. Policy and decision makers using analytical tools with the aggregate and de-identified personal information should be able to improve service choices for residents.

Data and Privacy Risks and Planned Mitigations

The PPIA developed for this proposal used a common-sense approach to identifying privacy risks for its main initiatives. It identifies privacy risks based on the ten CSA privacy principles and proposes practical mitigation strategies for projects where, although guided in the past by confidentiality approaches to personal information, would have limited privacy and security data management frameworks. The strategies identified are realistic relative to the current privacy expertise of the organizations and individuals guiding these projects, and to the required development of frameworks. Resources will be made available to guide these projects to achieve their privacy objectives.

The need for such frameworks has not only been readily recognized by the project proponents, but embraced in the expressed desire to ensure that the projects will be “doing it right” when it comes to establishing a privacy culture within not only the project, but within their organization.

The privacy risk assessment for the 10 CSA principles involves also a variety of existing compliance by projects. There are mitigating strategies suggested relative to compliance with all of these principles, but for some, mitigation will only involve using preparatory work already done to mitigate the risk (e.g. consent guidance, data element template to determine the “necessity”). See the table below for identified risks and their mitigations. The scoring for each of these risks is available in the PPIA.

Risk	Mitigation
Lack of accountability	<ul style="list-style-type: none"> Putting in place overall governance structure for the initiative and formally/publicly identify individual/position responsible for privacy on each project.
Lack of clear identified purpose of data collection/use, etc.	<ul style="list-style-type: none"> Develop and use a consent form that clearly identifies the specific purpose(s) for the collection, use and disclosure of personal information.
Lack of meaningful consent	<ul style="list-style-type: none"> Develop and use a consent form that clearly identifies the specific purpose(s) for the collection, use and disclosure of personal information, as well as the length of time it will be retained and what security there will be around it; review this annually by an independent third party; for NPO and Road Home develop/use a specific informed consent form for future collections of personal information by clients.
Failing to ensure appropriate respect for First Nations data and community privacy	<ul style="list-style-type: none"> All stakeholders will collaborate closely with St. Mary's First Nation Projects follow OCAP principles
Collecting more personal information than is necessary to achieve project goals	<ul style="list-style-type: none"> Modify and use a data element collection template that requires explanation of why each data element is necessary for Digital Fredericton, Digital Community Hub and “Doorable”; review by a third party annually.
Failure to limit use, disclosure to what is necessary	<ul style="list-style-type: none"> Develop and use a thorough informed consent form for clients interacting with the project that specifically limits further use and disclosure other than for the identified purposes of collection “except as authorized or required by law”; third party monitoring on an annual basis.
Failure to limit retention	<ul style="list-style-type: none"> Put the resources in place and develop an overall records retention policy for the FSC Program that is consistent with the Municipal Records Authority.
Incomplete/data/inaccurate information	<ul style="list-style-type: none"> Ensure that from a policy/protocol perspective that staff involved in project are reminded to verify and update client information; scheduled reminders for users to confirm information.

Data breach/inadequate safeguards leading to identification of residents and related risks including lack/loss of trust	<ul style="list-style-type: none"> Follow Privacy by Design Principles. Establish privacy and security infrastructure that incorporates what privacy and security features are required to ensure that personal information is protected relative to its sensitivity and vulnerability (+ server integrity/data back-ups). Establish and follow privacy framework including all protocols & policies noted in PPIA; security audits; conduct full privacy impact assessment.
Failure to be open and transparent about management of personal information	<ul style="list-style-type: none"> Continue the openness and transparency philosophy adopted for this initiative by ensuring that privacy features of the program are promulgated successfully through websites and open forums.
Failure to provide individuals access to their own information	<ul style="list-style-type: none"> Establish and promulgate procedures on web sites and other communication venues whereby individual citizens are informed of how they may obtain their own personal information that the organization holds on them.
Failure to communicate clearly about how to challenge compliance	<ul style="list-style-type: none"> Publish openly to whom and how individuals may complain about their privacy rights being compromised.

Implementation Phase Requirements

We have identified that the primary legislative requirements that relate to our projects relate to privacy (detailed in *Data and Privacy*.)

We recognize the **Duty to Consult** with First Nations on a broad range of issues. A key motivator for the City of Fredericton and St. Mary's First Nation to submit a joint proposal was to develop a closer relationship between our neighbouring communities. This process is the launching point for pursuing a Friendship Accord that will set a framework of governance and collaboration and establish processes for consultation for this and other initiatives of shared interest. The projects in this proposal are governed by the Smart Cities Task Force, which includes representatives from both the City of Fredericton and St. Mary's First Nation.

We recognize the **Community Employment Benefits (CEB)** initiative is designed to provide employment and/or procurement opportunities for: apprentices; Indigenous peoples; women; persons with disabilities; veterans; youth; recent immigrants; and small-medium-sized social enterprises.

As part of our vision to become a more inclusive, connected community supporting diversity, we will be participating in the CEB with respect to the following target groups:

- **Youth / Indigenous Peoples** – Appdigenous has committed to giving preference to qualified candidates who are chronically economically disadvantaged including, in particular, young indigenous individuals. Through this project – starting the summer of 2019 – six indigenous students and one project coordinator will be hired to undertake a research study to determine the number of wheelchair push button doors in Fredericton. Doorable will also partner with the Joint Economic Development Initiative (JEDI) to hire indigenous students for the programming and product development.
- **Small to Medium-Sized Social Enterprises** – Through Digital Fredericton's 'Connected Community' layer and the Digital Community Hub, citizens and entrepreneurs will be able to access open data to designs solutions to address community problems. As part of the Digital Fredericton project funding, we intend to procure and invest in new apps / startup companies to fuel procurement and more products from startups like Doorable, which will lead to job creation.
- **Women** – As part of our efforts to support social SMEs, an emphasis will be put on targeting and supporting female entrepreneurs. Already, Fredericton and St. Mary's First Nation have set the stage by supporting Melissa Lunney, Doorable Founder.

As part of the Smart Cities Challenge requirements, it is understood that specific CEB targets and a community employment benefits approach will need to be established when project funding is awarded.

Although the nature of the projects included in this proposal would suggest that a **Climate Lens Assessment** is not necessarily applicable, we have identified a potential for environmental issues to be addressed through future potential projects based on the

insights we develop on what matters most to residents. Some digital tools may be developed to have a positive environmental impact (e.g. to increase renewable energy use, recycling, reduce greenhouse gas emissions, etc.) In developing the IoT network, we are deploying urban sensors to monitor environmental conditions, such as flooding, air quality and localized weather conditions. Generating this data will allow us to engage the community in environmental solutions and identify how we can adapt to climate change and minimize our environmental footprint.

Implementation Phase Risks and Planned Mitigations

Risk	Mitigation
Traditional procurement processes used do not consider the opportunities presented by the Community Employment Benefits initiative.	The governance structure provides direct control over initiatives that impact procurement and the task force will be advised of the objectives of the CEB and provide governance over its implementation.
Failure to adequately consult First Nations	Implement Friendship accord to provide a governance structure for systematic oversight of issues of mutual interest.



Financial

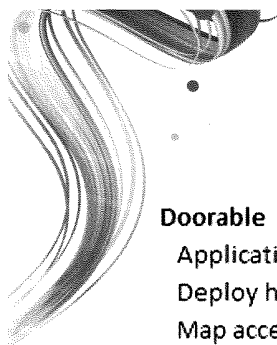
Comprehensive Project Budget

Revenue Including Own-Source and Partner Contributions

Funding	2019	2020	2021	2022	2023	Total
Own Source Revenue						
City of Fredericton Capital Budget for Digital Fredericton Core Systems	\$ 1,040	\$ 500	\$ 500	\$ 500	\$ 500	\$ 3,040
City of Fredericton Capital Budget for IoT sensors and new use cases	-	25	25	25	-	75
City of Fredericton Operating Funds - Staff Salaries for Smart Cities	150	150	150	150	150	750
City of Fredericton - IT Investments in New Cybersecurity	100	100	100	100	100	500
e-Novations Comnet Inc. - Investment in free community WIFI	375	-				375
	1,665	775	775	775	750	4,740
Direct Partner Contributions						
Confidential partner In-kind Investment in Innovation and data connections	100	100	100			300
ESRI - In-kind professional services contribution for Digital Community Hub	20	20	20	20	20	100
	120	120	120	20	20	400
Infrastructure Canada - Milestone Outcomes Based Payment	1,925	3,320	1,895	1,480	1,380	10,000
Total Funding	\$ 3,710	\$ 4,215	\$ 2,790	\$ 2,275	\$ 2,150	\$ 15,140

Detailed Project Expenditures

Expenditures for Outcomes	2019	2020	2021	2022	2023	Total
Digital Fredericton						
Core e-government services						
Utilities and Customer Billing		1,000				1,000
Work Management and Field Service Delivery			1,200			1,200
Digital Talent Strategy	150					150
HR Scheduling		875				875
Talent and Performance Management			1,425			1,425
Citizen Experience Strategy	240					240
Customer Relationship Management / 311 services				1,000	1,000	2,000
	390	1,875	2,625	1,000	1,000	6,890
Customer Experience Strategy						
Ethnographic Research (2 segments per year)		50	50	100	50	250
First Nations specific ethnographic research (2 segments - directed by SMFI)	50	50	50			150
Idea creation and user centred prototype design from ethnography insights	20	20	20	20	20	100
Digital Inclusion Tools application and technology development and innovat	125	250	-	250	125	750
Fist Nations specific digital tools resulting from ethnography			250	-		250
	195	370	370	370	195	1,500
NPO data collaboration						
Establish core systems and digital processes and acquire resources and talen	140					140
On-board early adopters		215				215
Build capacity and share data			175			175
Expand project and build data analysis capacity				175		175
Link data & connect aggregate data to Dashboard Community Hub					175	175
	140	215	175	175	175	880
Road Home						
Initialize digital core systems for shared client intake and case management						
Build Digital Inclusion Infrastructure and provide user technology	60	-	4	4		68
Provide technology resources for First Nations shelter	30		1	1		32
Upgrade free Public WIFI in Downtown Public Spaces and on Transit Buses	300	-				300
Create personalized digital inclusion tools - "Digital Street Guide"		125				125
	390	125	5	5	-	525



Doorable

Application and hardware development and technology platform
 Deploy hardware and software
 Map accessible City
 Create "Doorable" on-line community
 Integrate IoT parking sensor data to application

2019	2020	2021	2022	2023	Total
315	102				417
190	85	55			330
135					135
	80	173			253
		15			15
640	267	243	-	-	1,150

Dashboard, Digital Community Hub

Project mobilization with Data Analyst, Digital Community Hub Coordinator
 Technology procurement and platform development
 Build content and create user base
Release #1 - Accessible & Supportive
Release #2 - Cultural Connectedness
Release #3 - Economic Inclusion & Dashboard
Release #4 - NPO and Community Hub

345					345
60	60	60	15	10	205
					-
	210				210
		245			245
			245		245
				280	280
405	270	305	260	290	1,530

Transformation Management

Transformation and communications team consulting services
 Privacy Officer (Virtual Privacy Officer - Annual Review)
 Smart Cities innovation lab space
 SMFN dedicated lead for ethnography and technology initiatives
 Project Management - City Staff Dedicated to project
 Cybersecurity (Virtual CISO and Security Operations Monitoring)

350	130	130	130	130	870
20	15	15	15	15	80
10	20	20	20	20	90
75	75	75	75	75	375
150	150	150	150	150	750
100	100	100	100	100	500
705	490	490	490	490	2,665
2,865	3,612	4,213	2,300	2,150	15,140

Cashflow

845	603	-	1,423	-	25	-
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Contributions from Other Sources

As outlined above in the comprehensive budget, the City of Fredericton will directly contribute \$3.1 million in capital funding, along with \$1.25 million in operating funds for dedicated staff salaries and increased operating investments in cybersecurity.

The City's wholly owned subsidiary, e-Novations Comnet Inc. plans to contribute \$375,000 towards community digital infrastructure that will directly benefit this Smart Cities journey.

Our technology partners have also committed to in-kind investments of services and expertise:

- Confidential partner, \$100,000 per year in-kind investment in innovation
- Eleven-X Inc., half of the cost for the next 1000 connections on our IoT network for the next two years as in-kind contributions. This will total up to \$12,000 in connectivity fees.
- Esri Canada Inc., \$20,000 per year professional services support of the development of the Digital Community Hub.

Leverage Other Financial Sources

Many of the connected community applications will be developed by third parties as a repeatable business model. Doorable, Hullo and LiveKool each have a planned commercial business model supporting their social technology products. The Smart Cities funding will help seed the ideation, prototyping and preliminary market testing and development of these products.

Having validated the business use case with proven user adoption, many of the third parties will seek investor funding and access other government investment initiatives for technology innovation and business development including:

- The New Brunswick Innovation Foundation (NBIF)
- Atlantic Canada Opportunities Agency (ACAO)
- Opportunities New Brunswick (ONB)
- Business Development Bank of Canada (BDC)

This is not the first time the City of Fredericton has acted in the capacity as early adopter to bring technology innovations to market. The City has partnered with many start-ups including HotSpot Parking and Beauceron Security.

Working with the City of Fredericton as a first customer, HotSpot Parking was able to understand the problem and test solutions to build a repeatable business process. HotSpot then leveraged their experience and track record with the City to secure private equity funding including investments from NBIF and BDC. HotSpot has also leveraged funding from ACOA to develop and grow a sustainable business model. HotSpot now has over 30 major customers throughout Atlantic Canada and Ontario with 10 full time staff.

"It would not have been possible to attract funding and investment without the City of Fredericton as our first customer. The City shared their expertise to help us understand the problem and allowed us to test our prototypes and build a repeatable business model. This in-kind investment and direct access allowed us create a business from which to attract significant public and private investment"

Phillip Curley | CEO, HotSpot Parking

Financial Tools and Accounting Methodologies

The project will use traditional job cost reporting with monthly cashflow management to monitor and control project revenues and expenditures.

Accounting for the project will be handled within the City's financial accounting system and by the City's finance department and accounting staff. The overall project will be assigned a unique cost centre within the City's financial system and each of the project streams will be assigned a project job code within that cost centre.

All expenditures related to the project will be coded to the cost centre and project job code. The comprehensive budget will be further broken down into planned monthly cash-flows. As part of the City's regular reporting process, the actual expenditures by job will be compared with the planned cashflow monthly. Any variance greater than \$1,000 or 5% will be investigated as to the cause, and planned spending remaining to year end will be re-evaluated.

These two methods follow established processes on existing systems with experienced personnel and allow for detailed tracking and proactive course adjustments. The process is controlled within existing internal controls and has Council oversight.

Procurement will be subject to the New Brunswick Public Purchasing Act. Procurement will use the City's purchasing agents and established policies and financial systems.

Because Smart Cities funding is outcome-based using predetermined milestones, the City will provide upfront cash-flow requirements using own source revenues committed to this project. Early milestones have been set that allow for the project to be cashflow positive using this combination of City annual funding commitments and outcome-based payments.

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Where funding is allocated specifically for staffing through St. Mary's First Nation and other activities under the direction and control of St. Mary's, these payments will be made semi-annually in advance to St. Mary's for disbursement within those established management systems.

Methods, Sources, and Assumptions Used for Estimating Costs

We use several sources and methods to estimate costs:

1. Wherever possible we used experience from similar recent projects to estimate the cost of initiatives in this project plan.

Our estimates for Customer Experience Strategy, ethnographic research, and user-centred design are based on the cost of our finalist phase pilots of ethnographic research and user-centred design workshops. Each were conducted by professional consultants and costs for the scope of these activities are proven.

Throughout the finalist phase, we have also worked with Doorable to develop a complete functional version of the software application. The application was created by our ecosystem partner at BlueSpurs on the AWS serverless development platform as outlined in our technology strategy. Through this process of development, we can reasonably estimate the costs to develop other version 1 Digital Inclusion Tools.

We also worked with Esri to develop several features and functions of the Digital Community Hub. Our estimates for future development are provided by Esri and based on their clear understanding of our goals, and the amount of in-kind professional services taken to develop the prototypes.

We have experience delivering other key elements of our proposal including core government systems as outlined below.

2. Industry standard cost estimates, primarily for human resource costs.

Several of the estimated costs are for additional human resources to fill strategic roles in the development of Smart Cities data, digital content creation, analysis and administration. The costs of these positions are estimated from industry standard salary scales for these types of human resources.

3. Cost estimates from vendors for specific items contained in this proposal.

In building our cost estimates for core e-government services we have received cost estimates from our strategic partners at Deloitte and Oracle. These cost estimates are based on both on our recent experience implementing core financial and HR systems at the City of Fredericton, and also from their knowledge base of similar projects deployed by their teams.

4. We use agile development to minimize financial risks, fix total costs upfront and manage project to budget.

In order to minimize financial risk, we will use an agile approach to projects. This method helps to establish project estimates and resources first then work progresses in short sprints to develop, test, and implement solutions iteratively.

Using an agile approach involves focusing on shorter “sprints” with targeted functionality, allowing teams to develop prototypes to confirm requirements when needed. Consistent reviews by management are conducted at the end of each Sprint. This means issues will surface early and can be addressed immediately. When functionality is accepted by users it can be deployed. Because agile involves a process focus, it removes silos between teams and brings together all groups involved.

We chose an agile approach because:

- It allows **quicker delivery**, which can decrease the cost and accelerate the achievement of desired outcomes.
- It helps **build strong relationships** to fully understand current pain points to ensure both the technology and the people are ready for the digital transformation.
- It enables **accelerated delivery of high-priority features** and opportunities at regular intervals throughout the engagement for leaders and stakeholders to view demonstrations of key processes in the system.
- It enables **faster adoption** with increased knowledge transfer throughout engagement delivery.
- It enables **increased transparency and feedback**, offering opportunities for leaders and stakeholders to give input to the solution and identify issues as they arise.
- It allows for more **predictable costs** and allows for course corrections early.

5. We use detailed cost breakdowns of project subcomponents to estimate total cost and match them with milestones.

The detailed breakdowns of smaller project sub-components and intermediate steps allow for much more accurate costing of the overall project plan.

The following pages contain the detailed breakdown of costs by project area. These detailed breakdowns are the basis for cost estimations and used for preparing monthly cash-flow projections by project.

Together these techniques provide effective and consistent controls over budget and scope and provide routine opportunities for evaluation and course correction.

Financial Risks and Planned Mitigations

Risk	Mitigation
Cost and budget overruns	Use detailed cost breakdowns with monthly monitoring against planned annual cashflows for budget control. Use agile development to set project cost and build most important features first using iterative development to control project costs.
Procurement delays and red tape	Engage purchasing agents early in the process to advertise expression of interest calls to establish a pool of preselected partners.
Additional cost of administrative overhead	Use existing process and procedures and existing accounting systems to minimize creation of new reporting, controlling and administrative functions.
Lack of internal controls over external organizations	Where possible, have all expenditures paid through existing City finance and administrative controls. Where external agencies disburse funding directly, provide payments in installments and report on payments and monitor outcomes of projects through the Task Force Governance structure.
Cash-flow requirements due to outcomes-based payments	Seed projects with own source revenues enough to generate early proven deliverables, and track performance measures using progress to ultimate outcomes with earlier stage gates.
Financial burden of expenditures that fail to produce outcomes and trigger payments	Use performance measure that are broken down into early indicators of success to reduce the time between costs and evaluation of success. Provide written roles and responsibilities of the Task Force that outline their role to detect early failures and advise course corrections. Ensure that the Task Force is functioning effectively to receive and evaluate quarterly reports and has clear mandate to seek remediation and course correction.
Financial impact of cybersecurity or privacy breach	Use routine threat risk assessment, threat hunting and cyber security monitoring to reduce risks, and use annual privacy review to identify potential problems before they occur. Assess the need for cyber and privacy insurance to insurance against the financial risks from breaches.
Escalating pace of technology change that results in investments in outdated solutions	Use loosely coupled solutions in a service-oriented manner so continued development can occur even if not all requirements are known at the onset. Taking an Agile approach to solution development will also facilitate extensibility among technologies both current and future.

Project Costs with Timelines

Road Home

Phase	Phase Duration	Milestone	Milestone Date	Cost Breakdown
HIFIS4 Deployment	Ongoing	HIFIS Coordinator		In-Kind
	Sept-Nov/19	Onboard 5 agencies: (Fredericton Homeless Shelters Inc., John Howard Society of Fredericton, Capital Region Mental Health & Addictions, Youth in Transition, Liberty Lane)	Dec 1/18	
	Jan1-Mar 1/19	Complete data transfer from HIFIS3 to HIFIS4	Mar 1/19	grant
Training	Feb1-July 1/19	Create training capacity for HIFIS, SPDAT (train the trainers) & develop user manual	July 1/19?	grant
Technology	July 1-Nov 1/19	Deploy digital infrastructure/user tech to agencies above (fibre, hardware/software, licensing)	July 1/19	\$60,000
	2019	Upgrade free public WiFi	2019	\$150,000
Service Coordination	July1/19-July1/20	Onboard 3 additional agencies & coordinate services (St. Mary's First Nation shelter, Gignoo, Women in Transition)	July 1/20	
Technology	July 1-Nov 1/20	Deploy digital infrastructure (fibre, hardware, licensing) – First Nations shelter	July 1/20	\$30,000
	2020	Upgrade free public WiFi	2020	\$150,000
Service Coordination	July1/20-July1/21	Onboard 1 additional agency & coordinate services: - Fredericton Downtown Health Clinic	July 1/21	
	Feb 1/19-July1/21	Coordinate intake & assessment & triage model among 9 agencies, identify opportunities for improvement (OFIs)	July 1/21	
Technology		Digital inclusion infrastructure & tech resources (First Nations)	July 2/21	\$4,000 \$1,000
App Development	July 1/19-April1/21	Create personalized digital inclusion applications/tools (i.e. digitized street survival guide)	April 1/21	\$125,000
Digital Community Hub	Aug 1/20-April 1/21	Coordinate high level aggregate data based on indicators to 'city performance dashboard' and personal level resources	April 1/21	
Technology		Digital inclusion infrastructure & tech resources (First Nations)	July 1/22	\$4,000 \$1,000
Sustainability Plan		Coordinate plan among agencies.	2023	
Total				\$525,000

Non-Profit Data Collaboration

#	Phase	Phase Duration	Milestone	Milestone Date	Cost Breakdown
	Admin-HR	July 1/19 – Mar 31/20	Recruit, hire, orientate 3 staff <ul style="list-style-type: none"> Project Manager (GFSI) Process design consultant (GFSI) Data analyst (IRDT) Develop communication/ engagement plan	July 1, 2019	\$ 140,000
Loop 1 – early adopters	Project Management: process design, data-sharing agreements & onboarding	April 1/20 – Mar 31/21	<ul style="list-style-type: none"> Privacy and data sharing agreements signed with 10-NPOs Project protocols and organizational targets refined and approved data management assets and practices of 10 NPOs mapped 10 NPOs trained in in-house data analysis Phase 1 of process tool-kit developed 	April 1/20	\$ 100,000 (GFSI)
	Data security & Privacy Standards	April 1/20 – Mar 31/21	<ul style="list-style-type: none"> 10 NPOs privacy impact assessments completed, common data standards defined data sharing agreements created and signed 10 NPOs privacy and ethics compliance completed 	April 1/20	\$ 80,000 (IRDT)
	Build NPO capacity	April 1/20 – Mar 31/1	<ul style="list-style-type: none"> data sharing agreements signed privacy/confidentiality guidelines/templates implemented trained to link/analyze/explore in-house data NPO successes and gaps identified 		\$ 15,000 (NPO)
	United Way & Fredericton Community Foundation	July 1/19 – Mar 31/20	<ul style="list-style-type: none"> Creation/updated online funding applications with new data standards Consulted with partner agencies 	Mar 21/20	\$ 20,000 (UW & FCF)
Loop 2	Project Management: data-sharing agreements, onboarding 10 new Agencies	April 1/21 – Mar 31/22	<ul style="list-style-type: none"> onboarded 10 new agencies privacy and data sharing agreements signed project protocols and organizational targets develop and approved data management assets and practices mapped 10 NPOs trained in data analysis Testimonials and case studies from NPOs of improvements made based on data Process tool-kit completed 	April 1/21	\$ 80,000 (GFSI)
Loop 2	Data Security & Privacy Standards	April 1/21 – Mar 31/22	<ul style="list-style-type: none"> 10 NPOs privacy impact assessments completed, common data standards defined 10 NPOs privacy and ethics compliance data transferred to IRDT de-identify and data cleaning NPO data aggregated and anonymize to the community level link data to GNB data portals & Digital Community Hub 	April 1 /21	\$ 80,000 (IRDT)
Loop 2	Build NPO capacity	April 1/21 – Mar 31/22	<ul style="list-style-type: none"> data sharing agreements signed 	April 1/21	\$ 15,000 (NPO)

			<ul style="list-style-type: none"> privacy/confidentiality guidelines/templates implemented trained to analyze/explore in-house data trained to analyze/explore community-level data NPO successes and gaps identified 		
Loop 3	Project Management: data-sharing agreements, onboarding	April 1/22 – Mar 31/23	<ul style="list-style-type: none"> privacy and data sharing agreements signed with 10-NPOs data management assets and practices mapped trained 10 NPOs on data analysis 	April 1/22	\$ 80,000 (GFSI)
Loop 3	Data security, Linking, & Privacy Standards	April 1/22- Mar 31/23	<ul style="list-style-type: none"> 10 NPOs privacy impact assessments completed, common data standards defined Testimonials and case studies from NPOs of improvements made based on data 10 NPOs Privacy and ethics compliance transfer data to IRDT de-identify and data cleaning NPO data aggregated and anonymize to the community level link data to GNB data portals & Digital Community Hub 	April 1/22	\$ 80,000 (IRDT)
Loop 3	NPO Capacity Building	April 1/22- Mar 31/23	<ul style="list-style-type: none"> data sharing agreements signed Privacy/confidentiality guidelines/templates implemented train to analyze/explore in-house data train to analyze/explore community-level data NPO successes and gaps identified 	April 1/22	\$ 15,000 (NPO)
Loop 4	Project Management: data-sharing agreements, onboarding	April 1/23 – Mar 31/24	<ul style="list-style-type: none"> privacy and data sharing agreements signed with 10-NPOs develop and sign off on project protocols and organizational targets trained 10 NPOs on data analysis data management assets and practices mapped testimonials and case studies from NPOs of improvements made based on data 	April 1/23	\$ 80,000 (GFSI)
Loop 4	Data Security & Privacy Standards	April 1/23- Mar 31/24	<ul style="list-style-type: none"> 10 NPOs privacy impact assessments completed, common data standards defined 10 NPOs Privacy and ethics compliance transfer data to IRDT de-identify and data cleaning NPO data aggregated and anonymize to the community level link data to GNB data portals & Digital Community Hub 	April 1/23	\$ 80,000 (IRDT)
Loop 4	NPO Capacity Building	April 1/23- Mar 31/24	<ul style="list-style-type: none"> data sharing agreements signed privacy/confidentiality guidelines/templates implemented train to analyze/explore in-house data train to analyze/explore community-level data NPO successes and gaps identified 	April 1/23	\$ 15,000 (NPO)
	Total				\$879,000

Digital Fredericton

Agile approach with Sprint outline.

#	Phase	Phase Duration	Milestone	Milestone Date	Cost Breakdown
1	Work Management & Field Service Delivery				
	July 1/19-Feb 7/20 (30 wks)	Prework (2 wks)	<ul style="list-style-type: none"> Product selection finalized Product licensing (annual) Internal team identification 		\$50,000
		(4 wks)	<ul style="list-style-type: none"> Develop workplan Create status report templates Develop instance & integration strategy Develop test strategy Develop high level change management plan Confirm user stories 		\$150,000
		Sprint 1 Sprint 1 Spring 2 (4 wks)	<ul style="list-style-type: none"> Project financials Project costing Inventory 		\$200,000
		Sprint 3 (4 wks)	<ul style="list-style-type: none"> Field service core manage cloud & field service mobility cloud Maintenance management 		\$150,000
		Sprint 4 (4 wks)	<ul style="list-style-type: none"> Field service customer communication & field service routing Smart location cloud 		\$150,000
		Testing (4 wks)	<ul style="list-style-type: none"> Systems integration testing & user acceptance testing 		\$150,000
		Deploy (4 wks)	<ul style="list-style-type: none"> Process redesign & capability development 		\$150,000
		Deploy (4 wks)	<ul style="list-style-type: none"> Product cutover/support & transition 		\$100,000
	Phase 1 Sub-total				\$1,200,000
2	Utilities & Customer Billing				
	July 1-Dec 20/19 (25 wks)	Prework (2 wks)	<ul style="list-style-type: none"> Product selection finalized Product licensing (annual) Internal team identification 		\$100,000
		Sprint 0 (2 wks)	<ul style="list-style-type: none"> Develop workplan Create status report templates Develop instance & integration strategy Develop test strategy Develop high level change management plan Confirm user stories 		\$50,000
		Sprint 1 (3 wks)	<ul style="list-style-type: none"> Accounts receivable Contracts cloud service Development 		\$300,000
		Sprint 2 (3 wks)	<ul style="list-style-type: none"> Order management cloud 		\$125,000
		Sprint 3 (3 wks)	<ul style="list-style-type: none"> Advanced collections 		\$125,000

		Testing (4 wks)	<ul style="list-style-type: none"> Systems integration testing User acceptance testing 		\$100,000
		Deploy (4 wks)	<ul style="list-style-type: none"> Process redesign & capability development 		\$150,000
		Deploy (4 wks)	<ul style="list-style-type: none"> Product cutover/support/ transition 		\$50,000
	Phase 2 Sub-total:				\$1,000,000
3	Talent & Performance Management				
	July 1/21-Feb 11/22 approx. (30 wks)	Pework (4 wks)	<ul style="list-style-type: none"> Product selection finalized Product licensing (annual) Internal team identification 		\$50,000
		Sprint 0 (2 wks)	<ul style="list-style-type: none"> Develop workplan Create status report templates Develop instance & integration strategy Develop test strategy Develop high level change management plan Confirm user stories 		\$100,000
		Sprint 1 (4 wks)	<ul style="list-style-type: none"> Talent acquisition Succession management 		\$250,000
		Sprint 2 (4 wks)	<ul style="list-style-type: none"> Learning cloud service 		\$250,000
		Sprint 3 (4 wks)	<ul style="list-style-type: none"> Performance management 		\$250,000
		Testing (4 wks)	<ul style="list-style-type: none"> Systems Integration testing User acceptance testing 		\$250,000
		Deploy (4 wks)	<ul style="list-style-type: none"> Process redesign & capability development 		\$150,000
		Deploy (4 wks)	<ul style="list-style-type: none"> Product cutover/support/ transition 		\$125,000
	Phase 3 Sub-total				\$1,425,000
4	CRM/Portal				
	July 1/20-Aug/21 (56 wks)	Pework (4 wks)	<ul style="list-style-type: none"> Product selection finalized Product licensing (annual) Internal team identification 		\$400,000
		Sprint 0 (8 wks)	<ul style="list-style-type: none"> Develop workplan Create status report templates Develop instance & integration strategy Develop test strategy Develop high level change management plan Confirm user stories 		\$400,000
		9 sprints (4 wks/sprint x9 sprints=36 wks)	<ul style="list-style-type: none"> Citizen portal Enterprise contact center Interface cloud service 		\$900,000 \$100,000/sprint)
		Testing (4 wks)	<ul style="list-style-type: none"> Systems Integration testing User acceptance testing 		\$200,000
		Deploy (4 wks)	<ul style="list-style-type: none"> Product cutover/support/ transition 		\$100,000
	Phase 4 Sub-total				\$2,000,000

5	Customer Experience Strategy (cycle repeated annual: ethnography, insights, ideation, prototyping, tools)			
	July 1/19-July 1/23	2019	<ul style="list-style-type: none"> Citizen experience strategy 	\$ 240,000
		2021	<ul style="list-style-type: none"> Ethnography research (2 segments per year) 	\$100,000
		2022		\$100,000
		2023		\$100,000
		2019	<ul style="list-style-type: none"> First Nations specific ethnographic research (2 segments directed by SMFN) 	\$50,000
		2020		\$50,000
		annually	<ul style="list-style-type: none"> Ideation & prototyping based on insights 	\$20,000/year =\$100,000
		2019	<ul style="list-style-type: none"> Digital inclusion tools, application/tech development and innovation 	\$125,000
		2020		\$250,000
		2021		\$125,000
		2022		\$125,000
		2023		\$125,000
		2021	<ul style="list-style-type: none"> First Nations specific digital tools resulting from ethnography 	\$125,000
		2022		\$125,000
	Phase 5 Sub-total:			\$1,740,000
6	Digital Talent Strategy			
	July 1-Sept 18/20 (12 wks)	Sprint 1 (8 wks)	<ul style="list-style-type: none"> Digital employee talent proposition Define Skills identification Skills gap 	\$100,000
		Sprint 2 (4 wks)	<ul style="list-style-type: none"> Talent modelling Governance 	\$50,000
	Phase 7 Sub-total:			\$150,000
7	HR Scheduling			
	July 1-Dec 24/20 (26 wks)	Pework (2 wks)	<ul style="list-style-type: none"> Product selection finalized Product licensing (annual) Internal team identification 	\$150,000
		Sprint 0 (2 wks)	<ul style="list-style-type: none"> Develop workplan Create status report templates Develop instance & integration strategy Develop test strategy Develop high level change management plan Confirm user stories 	\$50,000
		Sprint 1-3 (6 wks)	Scheduling	\$375,000
		Testing (4 wks)	<ul style="list-style-type: none"> Systems Integration testing User acceptance testing 	\$100,000
		Deploy (4 wks)	<ul style="list-style-type: none"> Process redesign & capability development 	\$150,000
		Deploy (4 wks)	<ul style="list-style-type: none"> Product cutover/support/ transition 	\$50,000
	Phase 8 Sub-total:			\$875,000

Transformation Management

Smart Cities Program				
Digital Fredericton TMO Marketing/communications, & Consulting	2019			\$325,000
	2020			\$125,000
	2021			\$125,000
	2022			\$125,000
	2023			\$125,000
	annual	• Virtual Privacy officer		\$20,000 \$15,000 \$15,000 \$15,000 \$15,000
	2019 2020 2021 2022 2023	• Smart cities collaboration space		\$10,000 \$20,000 \$20,000 \$20,000 \$20,000
	annual	• SMFN lead for ethnography and tech initiatives		\$375,000 (\$75,000/year)
	annual	• Smart Cities project management – dedicated staff		\$750,000 (\$150,000/year)
		• Cybersecurity (virtual Chief Information Security Officer & security operations monitoring)		\$500,000 (\$100,000/year)
Sub-total				\$2,620,000

Digital Community Hub

#	Phase	Phase Duration	Milestone	Milestone Date	Cost Breakdown
1	Project Mobilization Admin-HR	July 1-Aug 1/19 Aug 1-31	Develop skill requirements and advertise posting (2 weeks) for data analyst, digital community hub coordinator, content creator Screen, interview candidates, select/sign contracts and set start dates (Oct 1 latest).	Aug 1/19	\$345,000
	Admin-Technology Procurement	July 1-Sept 1/19	Develop RFP package, tender/award project for platform development.	Sept 1/19	\$60,000
2	Platform Development	Sept 15/19-Feb 15/20	Develop Digital Community Hub platform ensuring compliance with data & security requirements (conduct user testing where required) for: 1. Smart City Dashboard 3. Personal Digital Inclusion	Feb 15/19	
3	Data Sharing Agreements	Oct 1-Nov 1	Sign 5 partnership agreements (Ability NB, Age Friendly Committee, CAGH, Appdigenous, NB-IRDT)	Nov 1/19	
4	Ethnography, Data Input & Testing	Aug 1-Oct 1/19	Via Digital Fredericton – conduct ethnographic research for 2 segments	Oct 1/19	
		Oct 1-Dec 1/19	Collect & input segment baseline data for dashboards	Dec 1/19	
		Early Feb/20	Pilot /user-centred design testing for 3 segments	Feb 19/20	
3	Data Sharing Agreements	Nov 1/19-Feb 1/20	Sign 5 data sharing agreements: TBA	Feb 1/20	
5	Release #1	Feb 19-Mar 31/20	Develop/deploy communications campaign / launch dashboard. Personal/2 segments +performance: • older adults community hub + integrate LiveKool • accessibility challenged (accessible community hub w/ data & map) • Smart City Performance Level • First Nations segment	April 1/20	\$245,000
6	Data Renewal Process	April 1-June 1/20	Create process for data refinement and identification	June 1/20	
2	Platform Development	Feb 19-Sept 1/20	Develop dashboard platform for Personal Interactive Level	Sept 1/20	\$60,000
7	Census 1		Establish 1,000 users / annual survey / produce community census	Nov 1/20	
4	Ethnography, Design Testing & Data Input	Aug 1/20-Feb 19/21	2 segments + 1 SMFN segment	Feb 19/21	
5	Release #2	Feb 19-Mar 31/21	Personal/3 segments + interactive: • Road home community hub (homeless segment including digital street guide) • Cultural /Newcomers community hub + integrate Hulloo	April 1/21	\$245,000

			<ul style="list-style-type: none"> • SMFN • +Personal interactive level 		
2	Platform Development	Feb 19— Sept 1/21	Develop dashboard platform for Organizational Level	Sept 1/21	\$60,000
4	Ethnography, Design Testing & Data Input	Aug 1/21-Feb 19/22	2 segments + SMFN	Feb 19/22	
2	Platform Development	Feb 19-Sept 1/22	Develop dashboard platform for Organizational Level	Sept 1/22	\$15,000
7	Census 2		Establish 2,000 users / annual survey for community census	Nov 1/21	
5	Release #3	Feb 19-Mar 31/22	Personal/3 segments (TBA) +community hub of interest and integrate user experience tech, applications and data	April 1/22	\$245,000
4	Ethnography, Design Testing & Data Input	Aug 1/22-Feb 19/23	2 segments + SMFN	Feb 19/23	
7	Census 3		Establish 5,000 users / annual survey / produce community census	Nov 1/22	
5	Release #4	Feb 19-Mar 31/23	Personal Level – 3 segments + organizational level	April 1/23	
4	Ethnography, Design testing & Data Input	Aug 1-Dec 1/23	2 segments + SMFN	Dec 1/23	
7	Census 4		Establish 10,000 users / annual survey / produce community census	Nov 1/23	\$245,000
2	Platform Development		Continued dashboard development for sustainability	Sept 1/23	\$10,000
8	Sustainability		Create project sustainability plan		
					\$1,530,000

Doorable

Phase	Phase Duration	Milestone	Cost Breakdown	Milestone Date
Mgt Team & Talent Acquisition	Feb 15- July 15/19	*Mgt team currently in place. Recruit technical staff, installers, CRM staff		July 15/19
Testbed of Users Created	Feb 15- June 30/19	250 downloads of Doorable app. Ver1.0		June 30/19
Sustainability Plan (See Attachment)	Feb 15- Dec 31/19	The Smart Cities funding, which in effect subsidizes 1000 installs of Doorable tech, generates sufficient revenue to undertake the development and growth of the technology as described in the budget. Costs unmet by the launch project are met by install purchases from organizations and businesses as well as through services offered to subscribers.		Dec 31/19 ("Sold" installs and subscriber services)
Research Strategy: Baseline Fredericton	May 6- Oct 11/19	Conduct inventory of all button accessible doors in Fredericton, and make available via Hub	\$135,000	Oct 11/19
Commercial Subscribers Testbed (subsidized installs)	May 19- Sept30/19	Sign 5 commercial customers and install hardware (testers) Private sector subscriber consultative group established		June 30/19
Intellectual Property	June 1- Aug 30/19	Develop patentable design schematics on DOORABLE hardware (Release 2)		Aug 30/19
Hardware Development: Web-based Black Box (Version 2) & Testing	June 1- Aug 30/19	Develop Version 2 of Doorable hardware with both wireless and internet connectivity allowing Doorable Release 2 of the User App to be a web capable (future proofing the hardware)	\$92,000	Aug 30/19
Mobile application design and implementation: Installer application version 1	July 1- Aug 30, 19	Develop Installer App to populate Data base of "Doorable" accessible doors on the "back end" and initialize device	\$35,000	Aug 30/19
Advisory Board	July 3- Aug 3/19	Constitute advisory board		Aug 3/19
SaaS Model	Aug 1- Dec 31/19	Create pricing structure for basic level of content management associated with Subscriber app.		Dec 31/19
Public Building Retrofits (Phase 1)	Sept 1- July 1/19	Fit all public buildings owned/ operated by Fredericton/St. Mary's with Doorable technology (HW Release 2)	\$150,000	July 1/20
Non-Profits-Retrofit Installations (Phase 2)	Sept 1- Oct 15/19	Fit NPOs participating in Smart Cities Proposal with Doorable (HW Release 2)		Oct 15/19
Hardware Upgrades in Test Sites	Sept 1- Oct 30/19	Conduct testing at Bluetooth enabled door (by Aug/19, the future proofed web capable units will be ready)	\$150,000	Oct 30/19
Commercialization/ Market Entry Strategy		(See Appendix - Business Model)		
User Education & Awareness Campaign	Ongoing	Enable online support of user community		July 15/19

Smart Cities Challenge

City of Fredericton & St. Mary's First Nation

Software (backend cloud server-data storage)	Sept 1- Nov 1/19	Develop back end software to support User App and Version 2 of Firmware	\$38,000	Nov 1, 2019
Mobile Application Design & Implementation: User Application Version 1.1	Sept 1- Nov 30/19	Release Version 1.1 (release 2) to User group.	\$40,000	Dec 13/19 Release date
Research Strategy: User Experience	Sept 1 – Nov 30/19	Create set of revisions driven by user experience		Nov 30/19
Mobile Application Design & Implementation: Subscriber Application Version 1	Sept1/19- Jan 24/20	Release #1 Subscriber App including content management and push features.	\$85,000	Jan 24/20
User Feedback System	Nov 16- Dec 13/19	Build integrated feedback system into User App and Subscriber App.		Dec 13/19
Doorable Community: Online user-user dialogue/community building	Mar31/20- Mar 1/21	Fully develop platform for user-user, user-subscriber dialogue on issues, projects, specific issue-based initiatives, project building.	\$172,500	Mar 1/21
Market Research – Subscriber Community	June1- Sept 1/20		\$80,000	Sept 1 /20
Mobile Application Design & Implementation: Subscriber Application Version 2	June 1- Dec 1/20	Fully develop platform for services to subscribers, including a fee for service model for content management, push services for interested users and a range of content offerings. Licensing options may be available and developed for large subscribers (i.e. GNB)	\$60,000	Dec 1/20
Mobile Application Design & Implementation: User Application Version 2.0	Nov 1/20- Mar 1/21	Major release of the User app synchronized with the release of Doorable Community.	\$55,000	Mar 1/21
Data storage and processing	Sept 1/20	Data storage and processing of subscriber data, Open data and User special research data	\$42,500	Sept 1/20
10,000 Users	Nov30/20	10% of Greater Fredericton residents		Nov 30/20
MRR SaaS: Fully featured Subscriber services	Dec 1/20- Ongoing	Develop subscriber app features, test/price/deploy		Dec 31/20
20,000 Users	Mar31/21	20% of Greater Fredericton residents		Mar 31/21
New Market Entries: - 2 new NB cities - 2nd province	Mar31/21- Mar31/22			Mar 31/22
60,000 users		Definable percentage of population market in 2 NB cities		Mar 31/22
120,000 users		Definable percentage of population market in 2nd province adopting the technology		Mar 31/23
National Reach	Mar31/22- Mar 31/23	Distribute/sell fully deployed and tested Doorable technology		Mar 31/23
Total			\$1,135,000	

Smart Cities Proposal | 94

Jacaban2, Evalynne (INFC)

From: Bell, Adam <Adam.Bell@Fredericton.ca>
Sent: March 4, 2019 2:43 PM
To: SC / VI (INFC)
Subject: Final Proposal - City of Fredericton and Saint Mary's First Nation 2 of 6
Attachments: Letters of Support.pdf

Please find attached City of Fredericton final proposal letters of support

This email is two of six that includes the following

1. Final proposal
- 2. Letters of Support**
3. Finalist Video link to download video
4. Preliminary Privacy Impact Assessment
5. Response from the Office of the Integrity Commissioner
6. Long text descriptions for accessibility requirements and transcripts

Point of Contact:

Adam Bell [REDACTED]
Assistant Director – Finance, Innovation & Technology
City of Fredericton
335 Queen St.
Fredericton NB, E3B 1B1
Phone: (506) 460-2182
Cell: (506) 478-2234

"Partnering with others to support our organization in making Fredericton the best place to live, work and play."

www.Fredericton.ca

Adam.Bell@Fredericton.ca





440 King Street
York Tower, Suite 201
Fredericton, NB E3B 5H8

February 19, 2019

City of Fredericton
Laurie Guthrie, Smart Cites Project Manager
357 Queen Street
Fredericton, NB E3B 1B1

Re: Smart City Dashboard, User-centered Design Support

Dear Laurie:

Accreon is pleased to provide in-kind contribution of professional services for the user-centred design of the Smart City Dashboard. Our services included the planning, design, preparation, and facilitation of the usability test with citizens of Fredericton, for the Smart City Dashboard prototype. The total value of these services as provided by Chelsea Wilson is estimated at \$1,500.

We are a full-service technology and business services firm that develops, integrates, and implements business enabled technology solutions for the interoperable world.

Our reputation and experience in the industry allow us to attract clients who are intent on achieving their business goals, leveraging IT, and improving their business processes in a cost-effective manner. Once engaged, our project team's knowledge of the subject matter is paramount to engaging stakeholders.

We are pleased to be able to offer support to the Smart City Dashboard, as Fredericton seeks to connect people from all segments of the population with services and support.

Sincerely,

A handwritten signature in black ink, appearing to read 'G. Phillips'.

Greg Phillips, Senior Vice President, Professional Services
Accreon



APPDIGENOUS
merging technology with tradition

February 8, 2019

(506) 261-4297 /
info@appdigenous.com
458 Forest Hill, Fredericton NB, E3B 4K4

Appdigenous is honored to be a private sector partner in the Fredericton Smart Cities Initiative, 2019. In that connection we are particularly pleased to partner with the City of Fredericton in rolling out the first iteration of DOORABLE; a next generation technology that allows users to activate push button access doors through a mobile application.

The application, which is provided free to users, is intended to create a much more inclusive city, facilitating fluid movement throughout the civic space. Ultimately the technology also allows users, property owners and civic leaders to engage in ongoing community building and discourse centred on the question of inclusive access. By enabling the access of the most challenged to the full range of physical infrastructure, DOORABLE empowers the entire community.

The technology is predicated on the conviction that the City will be enriched by every effort that unleashes the human potential of every citizen, particularly those citizens whose contribution to the civic experience is hampered by legacy access solutions that are expensive, ineffective and out of date.

Consistent with the hiring objectives of DOORABLE, preference will be given to those qualified candidates who are chronically economically disadvantaged including, in particular, young indigenous individuals. Additionally, as part of an overarching commitment to user centered design and decision making, persons with disabilities will also be an important part of the brain trust that drives the growth of this technology. These commitments to community development, in all its forms, are integral to the social responsibility DNA of Appdigenous.

It is particularly gratifying, therefore, that the City of Fredericton has so fully embraced their own vision of an urban space which is enriched by the contributions of every citizen. The least advantaged have a great deal to offer and their experience is instructive in creating a truly smart and inclusive city. DOORABLE is pleased to contribute to that vision, by making the built environment, a foundation of every city's infrastructure, accessible, smart and a platform for dialogue.

Our participation and significant investment in the Smart Cities Initiative is full evidence of our full throated endorsement of the proposal being put forward by the City of Fredericton.

Melissa Lunney
CEO Appdigenous Development Inc.



BEAUCERON

February 26th, 2019

Dear Smart Cities Judging Committee,

I would like to take the opportunity to endorse the Fredericton and Saint Mary's First Nation Joint Submission for the federal Smart Cities Challenge.

Empowering people is a value shared by Beauceron Security and the City of Fredericton.

It has been an honour to work with the City of Fredericton IT team over the past two years, as an early client of our pioneering cybersecurity engagement and risk management platform. I have experienced first hand the skill, vision and passion the city will employ to successfully execute on their proposal.

I can also attest to their commitment to cybersecurity, privacy, data, and connected technology. As we strive to build the smart cities of tomorrow, ensuring they are secure and respect the privacy rights of citizens is fundamental. Fredericton's commitment to empowerment and engagement for its employees and to continuous improvement in its people, processes, culture and technology is a powerful example for other Canadian municipalities.

The City has been generous in sharing lessons learned in security and privacy with municipalities throughout North America. I can think of no better Canadian city, town or village that embodies both the spirit of innovation and collaboration than the city of Fredericton.

I would be happy to elaborate on my endorsement at any time.

Thank you for the opportunity to express my sincere support for this submission.

Regards,

David.

Beauceron Security Inc.
61 Carleton St.
Suite 3
Fredericton, NB
Canada E3B 3T2
beauceronsecurity.com

David Shipley, BA, MBA, CISM
Chief Executive Officer
david@beauceronsecurity.com
1.506.478.1619

**FRUM
DEVELOPMENT
GROUP**

Brookside Mall
435 Brookside Drive, Unit 55
Fredericton, NB E3A 8V4
(506) 458-9038
(506) 450-3747 - Fax

To: All members of the Smart Cities Challenge Jury

It is our pleasure to offer our unequivocal support and endorsement of the Smart Cities Initiative proposed to Infrastructure Canada by the City of Fredericton. We at the Brookside Mall, and at Frum Development Group in general, take pride in our capacity to innovate, embrace the challenge of change and to leverage technology to improve the experience of our diverse clientele.

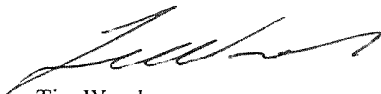
The Brookside Mall, like many spaces created in the late 1970s, was originally conceived of as a pure retail space. As the retail market changed and as the demographics shifted in our community, we faced the challenge of remaining a relevant and sustainable business. We made a calculated decision that Brookside would have to evolve into a multi-use centre. That decision required corporate courage and investment. To meet our aspirations, we have invested millions of dollars in redevelopment, including in particular, leading edge technology such as Fibre Op to satisfy the twenty-first century aspirations of our clients.

We continue to strive to make advancements and our center now has an excellent reputation for one stop shopping with retail and restaurants combined under one roof while also offering the public a wide variety of other services such as financial planning, medical offices, childcare, and entertainment, as well as health and wellness services. In addition to goods and services, Brookside now hosts a computing and business centre of Service New Brunswick and an internet dependent CRM service centre. In many ways, Brookside is as much a community as it is a business.

In addition, Brookside has for a number of years been home to an innovative training and development program of the Joint Economic Development Initiative (JEDI) focussed on training and development by and for First Nations individuals. This program is built around leading edge IT including cybersecurity, mobile applications development, software testing, big data analytics and entrepreneurial development. It is particularly satisfying that Brookside can lay claim to being the birthplace of many successful business start-ups for young indigenous entrepreneurs. DOORABLE and its parent company Appdigenous, now a major player in the Fredericton Smart Cities initiative, was one such company. It is a pleasure therefore, to be the first private sector adopter of this next generation access technology.

The diversity of our clientele and of the people who visit our centre testifies to the importance of embracing diversity, inclusion and innovation as a catalyst for success in a changing marketplace. That such ideas have been embraced by the City of Fredericton is indeed timely and important. We applaud their efforts and the vision of a Smarter city. By reimagining our civic space as centred on the people who live, work and shop here; we are creating the right environment for success and growth. Cities, businesses and community are built by people whose needs are met and contributions enabled.

This has been, in large measure, a key ingredient of our success and evolution. We don't just rent space; we create a space where we can work with individuals and companies to realize goals and aspirations.



Tim Woods
Property Manager

March 1 , 2019

Re: Smart Cities Challenge – Deloitte Transformation Agreement

To Whom it May Concern:

Deloitte is deeply invested in the City of Fredericton's success and is inspired by the City's digital ambition to recognize and connect each citizen to the things that matter most, and enable them to experience an exceptional quality of life.

In fact Deloitte has formed a long-term strategic relationship to support the City's goal to digitally transform itself and become the most innovative municipality in Canada. In doing so we recognize that collaboration is critical to enabling both organizations to perform at higher levels toward a shared vision of community and citizen impact. To date, Deloitte has invested over \$1M in helping the City realize its vision.

We are proud of the milestones that the City and Deloitte have achieved together thus far. We are also thrilled to have the opportunity to continue to collaborate, along with community groups, Oracle and other private companies, and others to achieve the Digital Fredericton aspirations of improving quality of life and driving economic prosperity. We are confident that together, an ecosystem will mature to fundamentally change the way the City works and interacts with its citizens.

Regards,



Greg MacQuarrie
Partner
Deloitte Inc.

Member of Deloitte Touche Tohmatsu Limited



February 21, 2019

Smart City Challenge Jury
Infrastructure Canada
180 Kent Street
Suite 1100
Ottawa, Ontario, K1P 0B6

Dear Smart City Challenge Jury,

RE: Letter of Support for City of Fredericton

eleven-x has been working with many cities over the past several years doing smart city projects from smart parking to waste bin monitoring to well water monitoring. Shortly after we started working with the City of Fredericton, it became apparent that this is not your average city. Before I get into that, let me describe the project we are working on together. The City of Fredericton is working with eleven-x to provide IoT solutions to solve some of the problems they have identified in their community. Our role is to deploy and operate our LoRaWAN wireless IoT network in Fredericton to enable many applications to be developed that otherwise could not be practically realized. Examples include smart parking, water metering, flood level detection, and smart agriculture. In addition, we are working closely with the City to bring the solutions to life whether that is by sourcing and testing the most appropriate sensor devices from around the world to creating application software.

So, what sets the City of Fredericton apart? First, they already had an impressive amount of Smart City infrastructure in place. Specifically, they had their own fiber network, city-wide Wi-Fi, and an impressive operational open data platform. In addition, they were already working with a local company to develop a Smartphone app to help people with accessibility issues. Impressive for any city of any size, in my humble opinion. Second, they move at lightning speed compared to any other city we have encountered. For example, the RFP was issued in September and awarded in October, our network was deployed several weeks after that and the in-ground parking sensors were installed shortly after that. In around three months they went from initiating the RFP to getting real-time parking data. Third, they listened to their community to find out what is important to them, structured their Smart City Challenge Statement around that, and found an innovative way to address the challenge with technology. The first parking spots that Fredericton choose to monitor are the handicapped parking spots. The data is being fed into their existing open data platform and from there into the accessibility parking app I mentioned earlier. Fourth, in case it is not obvious, Fredericton is willing to take risks and be early adopters. I can tell you this is very uncommon for cities, but it is a fundamental and often overlooked ingredient required to truly achieve innovation.

It has been refreshing and an absolute joy working with a city like Fredericton. We believe in what they are doing and are fortunate to be partnered with them. In fact, we are willing to contribute half of the cost for the next 1000 connections on our network for the next two years as in-kind contributions. This will total up to \$12,000 in connectivity fees.



The City of Fredericton is a role model for other cities to look to for how to be smart. They set an excellent example for Canada and the rest of the world.

Sincerely,

A handwritten signature in black ink that reads 'Ryan Hickey'.

Ryan Hickey
COO
519-998-6164
ryan.hickey@eleven-x.com

February 12, 2019

Smart Cities Challenge Jury

Subject: Letter of Support for the City of Fredericton's Submission

Esri Canada is pleased to provide this letter of support for the City of Fredericton's submission to the Smart Cities Challenge sponsored by Infrastructure Canada.

Esri Canada is a privately held, Canadian-owned company that provides world-class enterprise geographic information system (GIS) solutions. Headquartered in Toronto, we operate from 16 offices across the country (*including one in Fredericton*) with more than 10,000 Canadian customers across various industry sectors.

We have had the privilege to work closely with the City of Fredericton over the last 7 years and fully understand that local governments like Fredericton are being called upon to be more efficient, transparent, and accountable. Many of these local governments across Canada employ GIS technology to improve decision making, service delivery and citizen engagement.

Fredericton is a forward-thinking city that has a vision toward instituting policies and procedures which enable it to make data-driven decisions, maintain constant awareness of community activities, and stay connected with all its constituents. Effective smart cities do so by applying a Hub approach that connects people with the information and technology to improve quality of life, drive innovation, and offer better access to information. Fredericton will accomplish this by exploiting a combination of Internet of Things (IoT) devices, big data, inclusive apps, and community feedback to gain previously unimagined insight on its community.

As a trusted technology partner, Esri Canada is excited to be working with the City of Fredericton on its desire to become a smarter and more engaged community by helping the City implement the Hub framework that provides their stakeholders with timely access to information and data that is uniquely relevant to their needs.

Esri Canada fully supports Fredericton's goal to become a smarter city and have donated over \$50,000 in technology and supporting services to assist in its transformation.

Sincerely,



Alex Miller
President

12 Concorde Place, Suite 900
Toronto, Ontario M3C 3R8

T 416 441 6035
F 416 441 2106

esri.ca



January 14, 2019

The Smart Cities Challenge
Infrastructure Canada
180 Kent Street, Suite 1100
Ottawa, ON K1P 0B6

Dear Selection Committee Members:

Re: Fredericton and Saint Mary's First Nation Joint Submission for the Smart Cities Challenge

I am pleased to express New Brunswick Community College's (NBCC) support for the joint proposal by the City of Fredericton and Saint Mary's First Nation for the Smart Cities Challenge.

The joint Submission for the Smart Cities Challenge by Fredericton and Saint Mary's First Nation aligns with the vision and purpose of New Brunswick Community College. Our vision is to transform lives and communities. We are a collaborative, learner-centred college – creatively contributing to social and economic prosperity through applied learning and applied research. The involvement of St. Mary's First Nation in this project aligns with our strategic priority to engage in authentic partnerships with Indigenous communities, and to increase opportunities for staff and students to learn from and about Indigenous knowledge, culture and history.

Our College's Natural Sciences and Engineering Research Council – Industrial Research Chair in Mobile and Ubiquitous Computing, Dr. William McIver Jr., has participated in the development of this proposal. A major part of the research he conducts in his Centre for Applied Research in Mobile & Ubiquitous Computing relates to the objectives of and technologies that will be implicated in the project that Fredericton and St. Mary's First Nation is proposing. Dr. McIver is committed to contributing to the implementation of the proposal through his applied research and experimental technology development activities.

NBCC is active in applied research. We collaborate with industry partners on applied research and innovation projects that stimulate the commercialization of new and improved technologies while enhancing business opportunities. Using our expertise, equipment and facilities, we help solve technical and business problems, take advantage of market opportunities, and develop innovative technologies and processes that will enhance the way we live, work and do business. Our key areas of focus at this time are mobile and ubiquitous computing, healthcare, value-added food, energy efficient technology, advanced manufacturing, and social innovation. We actively engage staff and students in our applied research with the goal of enriching the learning experience for our students, as well as helping advance industries and communities and supporting economic development in the Province.

New Brunswick Community College
284 Smythe Street, Fredericton, NB E3B 3C9 Canada
tel: (506) 444-4882 fax: (506) 462-5008 email: marilyn.luscombe@nbcc.ca | nbcc.ca

Amherst

Fredericton

Saint John

Miramichi

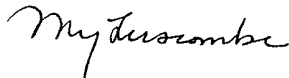
Moncton

Woodville

NBCC has been a provincial Crown corporation since 2010, and is directed by a Board of Governors and headed by a President and Chief Executive Officer. We are hold accountabilities to the Minister of Post-Secondary Education, Training and Labour. We are proud to contribute to New Brunswick's socio-economic prosperity through innovative hands-on training, supported with state-of-the-art equipment and real-world experiences that help learners achieve their career aspirations and meet the needs of employers and labour markets. Through on-going and industry-responsive programming, NBCC offers over 90 diploma and certificate programs, in 16 different economic sectors, across our six campuses throughout the Province. We also provide contract and customized training for industries and organizations. NBCC operations and our graduates contribute \$1.5 billion to the New Brunswick economy. Ninety-four per cent of our employed 2016 graduates are working in New Brunswick.

It is our privilege to support this innovative proposal and partnership.

Yours sincerely,



Marilyn Luscombe
President and CEO

New Brunswick Community College
284 Smythe Street, Fredericton, NB E3B 3C9 Canada
tel: (506) 444-4882 fax: (506) 462-5008 email: marilyn.luscombe@nbcc.ca | nbcc.ca

St. Andrews

Fredericton

Saint John

Miramichi

Moncton

Shediac

Société Alzheimer Society

NEW BRUNSWICK /
NOUVEAU BRUNSWICK

November 20, 2018

Dear Greater Fredericton Social innovation:

Please accept this letter as confirmation of our interest in moving forward with the Non-profit Data Collaboration project that is part of the City of Fredericton's Smart Cities Challenge.

We believe the ability to link and share information with other data sources and agencies will help us to better support our community by taking a collaborative approach to care. We see enormous potential and value in this project and are eager to learn more.

We look forward to the next steps in this project.

Sincerely,



Jess Baxter
Admin Assistant & Program Support
Alzheimer Society of NB
(506) 459-4280
jbaxter@alzheimermb.ca

Alzheimer Society of New Brunswick / Société Alzheimer du Nouveau Brunswick
P.O. Box 1553, Station "A", Fredericton, New Brunswick E3B 5G2
Tel/Tél: (506) 459-4280 Fax/Téléc: (506) 452-0313
Charitable registration #/ Numéro d'organisme de charité: 89328 0263 RR0001



Smart Cities Challenge
Fredericton, NB

February 11, 2019

Dear Committee Members,

Civic Tech Fredericton serves as the connective tissue between citizens, non-profit organizations, government innovators and our tech community. We facilitate knowledge sharing and work collaboratively to build digital tools.

The Civic Tech team consists of volunteers from our IT sector who meet every Tuesday night to develop technical solutions to address social issues. Along with our very skilled developers, project managers, and data scientists, we also have a host of people who have expertise in data/visualization and GEO spatial analysis.

The Civic Tech team is looking forward to partnering with our non-profit community, through the NPO Data Collaboration project, to train and support our non-profit community on how to link appropriate data sets, utilize visualization technology and perform analysis for better decisioning. We believe the NPO Data Collaboration project is a game changer for our community and look forward to sharing the success of this project with other Civic Techs across Canada.

Sincerely,

A handwritten signature in black ink, appearing to read "J Maitland".

Jules Maitland, PhD
Co-founder
Civic Tech Fredericton
CivicTechFredericton@gmail.com



Boys & Girls Club
of Fredericton

A good place to be

Greater Fredericton Social Innovation
Fredericton, NB

November 29, 2018

Dear Greater Fredericton Social innovation:

Please accept this letter as confirmation of our interest in moving forward with the Non-profit Data Collaboration project that is part of the City of Fredericton's Smart Cities Challenge.

While we are still clarifying the ways that we will be able to collaborate with this project, we believe the ability to link and share information with other data sources and agencies, will help us to better measure outcomes while fostering collaboration.

We look forward to the next steps in this project.

Sincerely,

Karen MacAlpine
Executive Director

Registered Charitable Organization No. 118 93 1120 RR0001
499 Canterbury Drive
Fredericton, NB E3B 4M4
T (506) 472-5112
F (506) 472-8947
www.fbgc.ca

Greener Village

People Helping People

686 Riverside Dr
Fredericton, NB
E3A 8C2, Canada

Tel: 506.459.7461
greenvillage.org

Date: 12 February 2019

Dear Greater Fredericton Social innovation:

Please accept this letter as confirmation of our interest in moving forward with the Non-profit Data Collaboration project that is part of the City of Fredericton's Smart Cities Challenge.

We believe the ability to link and share information with other data sources and agencies, will help us to better measure outcomes while fostering collaboration. We look forward to the next steps in this project.

Sincerely,



Alex Boyd
Executive Director
Greener Village, Home of the Fredericton Food Bank
Serving our community for 35 years!





January 16, 2019

Greater Fredericton Social Innovation
PO Box 30069
Fredericton, NB
E3B 0H8

Dear Greater Fredericton Social innovation:

Please accept this letter as confirmation of Liberty Lane's interest in moving forward with the Non-profit Data Collaboration project that is part of the City of Fredericton's Smart Cities Challenge.

We believe the ability to link and share information with other data sources and agencies will help us to better measure outcomes while fostering collaboration.

We look forward to the next steps in this project.

Sincerely,

Fiona Williams
Executive Director
Liberty Lane Inc.

P.O. Box 1441, Stn A, Fredericton, NB, E3B 5G2 Phone(506) 451-2120 Fax (506) 450-9877
www.libertylane.ca



Fredericton Public Library
Bibliothèque publique de Fredericton
12 Carleton Street / 12, rue Carleton, Fredericton, NB E3B 5P4
Tel / Tél : (506) 460-2800 - Fax / Téléc. : (506) 460-2801
Email / Courriel : fronpub@gnb.ca
Web: www.gnb.ca/publiclibraries

Fredericton Public Library - Nashwaaksis
Bibliothèque publique de Fredericton - Nashwaaksis
324 Fulton Avenue / 324, avenue Fulton, Fredericton, NB E3A 5J4
Tel / Tél : (506) 453-3241 - Fax / Téléc. : (506) 444-4129
Email / Courriel : nashwaaksis.library@gnb.ca
Web: www.gnb.ca/publiclibraries

January 15, 2019

The Non-Profit Data Collaboration project will help Fredericton non-profits collect more meaningful secure data to better inform policy development and program design. Collecting accurate and authentic data is often a challenge for non-profits as they are addressing immediate community needs and often run on the speed of volunteers to undertake their very important work. This project aims to help non-profits collect accurate data by providing supports, develop comprehensive toolkits for streamlined data collection and begin using a common data platform.

Fredericton non-profits do an amazing amount of work supporting all demographics of our community from sports organizations to food accessibility programs to transitional housing. If we can make some of their administrative work simpler, it will touch the entire community and improve the lives of all citizens.

As a community hub, the Fredericton Public Library supports other non-profits by providing access to information and data that helps support grant proposals, offers access to resources for research and provides space to conduct programs and public information sessions. The data collection project will be incredibly valuable in the long term, as it will enable non-profits to identify gaps in services and align their organizations with other government priorities. Supporting the success of non-profits is a win-win for the entire community.

Sincerely,

Julia Stewart
Director, Fredericton Public Library

Meals on Wheels of Fredericton Inc.
65 Brunswick Street
Fredericton, NB
E3B 1G5



Phone: (506) 458-9482
Fax: (506) 458-2606
info@frederictonmealsonwheels.ca
www.frederictonmealsonwheels.ca

Date: December 3, 2018

Dear Greater Fredericton Social innovation:

Please accept this letter as confirmation of our interest in moving forward with the Non-profit Data Collaboration project that is part of the City of Fredericton's Smart Cities Challenge.

We believe the ability to link and share information with other data sources and agencies, will help us to better measure outcomes while fostering collaboration.

We look forward to the next steps in this project.

Sincerely,

A handwritten signature in cursive script, appearing to read "B. Daniels".

Executive Director

bdaniels@frederictonmealsonwheels.ca



New Brunswick Social Pediatrics
PO Box 2100, 400 University Avenue
Saint John, NB E2L 4L2
Phone: (506) 648-7890

February 12, 2019, 2019

Dear Smart Cities Challenge Reviewers,

I am writing to express our enthusiastic support for the City of Fredericton & Saint Mary's First Nation as finalists in Infrastructure Canada's Smart Cities Challenge. New Brunswick Social Pediatrics is devoted to the development, implementation and evaluation of programs that improve the quality of life of New Brunswick families and children. We believe this project aligns clearly with our values and goals. The thought and innovation that has gone into this application clearly reflects the voice and experience of the community, which is key to social innovation.

NBSP has plans to hire a Data Standards Specialist valued at approximately \$80,000 per year over a three year period, to develop standardized data collection and program evaluation techniques for Non-Governmental Organizations (NGOs) across various sectors in NB. This will include a cloud-based data platform where NGOs can input their deidentified data and then have assistance with their evaluations. We are confident that the close alignment of our project and this one will provide numerous opportunities to leverage expertise and resources to strengthen both projects. We are confident that you will also see the merit of Fredericton's project throughout your review process.

Warm regards,

Sarah Campbell
Research Manager, New Brunswick Social Pediatrics

Date: November 21, 2018

Dear Greater Fredericton Social Innovation:

Please accept this letter as confirmation of our interest in moving forward with the *Non-profit Data Collaboration Project* that is part of the City of Fredericton's Smart Cities Challenge.

We, at the Pond-Deshpande Centre of the University of New Brunswick and the New Brunswick Social Policy Research Network, believe the ability to link and share information with other data sources and agencies, will help us to better measure outcomes while fostering collaboration.

We look forward to the next steps in this project.

Sincerely,



Karina LeBlanc

Executive Director

Pond-Deshpande Centre & New Brunswick Social Policy Research Network

Cell: 506-471-7411 | Office: 506-451-6923 | @ponddeshpande

University of New Brunswick

Suite 134, National Research Council Building

P.O. Box 4400

Fredericton, New Brunswick

Canada

E3B 5A3



OPAL III – FREDERICTON RESPITE SERVICES INC.

500 Beaverbrook Court, Suite 420, Fredericton, N.B. E3B 5X4 (506) 457-9520 Email: director@opalfamilyservices.ca

November 20, 2018

Dear Greater Fredericton Social innovation:

Please accept this letter as confirmation of our interest in moving forward with the Non-profit Data Collaboration project that is part of the City of Fredericton's Smart Cities Challenge.

We believe the ability to link and share information with other data sources and agencies, will help us to better measure outcomes while fostering collaboration.

We look forward to the next steps in this project.

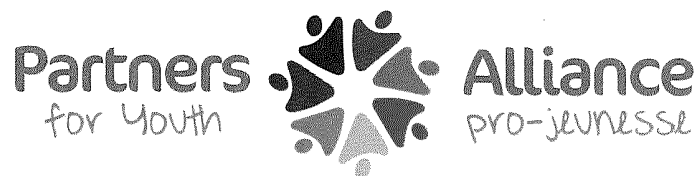
Sincerely,

Erica Young, Executive Director

Opal Family Services

500 Beaverbrook Court Suite 420

Fredericton NB E3B5X4



February 26, 2019

Dear Greater Fredericton Social innovation:

Please accept this letter as confirmation of Partners for Youth's interest in moving forward with the Non-profit Data Collaboration project that is part of the City of Fredericton's Smart Cities Challenge.

We believe the ability to link and share information with other data sources and agencies, will help us to better measure outcomes while fostering collaboration.

We look forward to the next steps in this project.

Sincerely,

Fiona Williams

Executive Director

535 Beaverbrook Court, Suite B 10, Fredericton, NB, E3B 1X6, 506-462-0323
www.partnersforyouth.ca, CCRA #: 899522387rr0001



Suite 134, National Research Council Building
University of New Brunswick
46 Dineen Drive, P.O. Box 4400
Fredericton, NB, Canada, E3B 5A3
506.451.6826 innovate@unb.ca
www.ponddeshpande.ca

Date: November 21, 2018

Dear Greater Fredericton Social Innovation:

Please accept this letter as confirmation of our interest in moving forward with the *Non-profit Data Collaboration Project* that is part of the City of Fredericton's Smart Cities Challenge.

We, at the Pond-Deshpande Centre of the University of New Brunswick and the New Brunswick Social Policy Research Network, believe the ability to link and share information with other data sources and agencies, will help us to better measure outcomes while fostering collaboration.

We look forward to the next steps in this project.

Sincerely,

Karina LeBlanc

Executive Director

Pond-Deshpande Centre & New Brunswick Social Policy Research Network

Cell: 506-471-7411 | Office: 506-451-6923 | [@ponddeshpande](https://twitter.com/ponddeshpande)

University of New Brunswick

Suite 134, National Research Council Building

P.O. Box 4400

Fredericton, New Brunswick

Canada

E3B 5A3



March 1, 2019

City of Fredericton
335 Queen Street
Fredericton, NB, E3B 1B1

Dear Smart Cities Challenge Jury Members:

Re: Letter of Support for Fredericton/St. Mary's First Nation Smart Cities Challenge Initiative

On behalf of Rogers Communications, I am pleased to offer this letter of support for the City of Fredericton's and St. Mary's First Nation's Smart Cities Challenge initiative.

As the City's telecommunications provider of 3 years, Rogers partnered with the City to provide in-kind services related to innovation and digital transformation as it relates to the Digital Fredericton project and the Smart Cities Challenge in its entirety.

Fredericton /St. Mary's challenge addresses the fundamental need that municipal interactions with citizens be as effective, timely, and relevant as possible. This challenge means adopting a technological approach that uses contemporary channels such as mobile apps, on-line access, and the Internet of Things, all within a secure and trusted information infrastructure.

As a national player in the ICT sector, Rogers views its participation in the Fredericton/St. Mary's Smart Cities Challenge initiative as a new opportunity to improve the way of life for the people living and working in the city. For economic development, for business growth, and for sustainability in the cities themselves. Smart cities need smart partners to help them solve for their needs. With our 20 years of experience implementing IoT solutions, we empower municipalities with industry-leading partner solutions, proven expertise and the network they need to realize all the benefits of IoT. We're committed to delivering IoT experiences that help organizations make more possible.

Sincerely,



Troy Harnish
Regional Vice-President, Rogers for Business
Rogers Communications Inc.



Skigin-Elnoog Housing Corporation

366 Gibson Street • Fredericton, New Brunswick • E3A 4E6

Telephone (506) 459-7161 • Toll Free 1-800-561-4024

Facsimile (506) 459-1289

November 27, 2018

Dear Greater Fredericton Social innovation:

Please accept this letter as confirmation of our interest in moving forward with the Non-profit Data Collaboration project that is part of the City of Fredericton's Smart Cities Challenge.

We believe the ability to link and share information with other data sources and agencies, will help us to better measure outcomes while fostering collaboration.

We look forward to the next steps in this project.

Sincerely,

Christin Swim,
General Manager

NIHKANAPOLTIPON – We are looking forward to the future



WIL-DO CYCLE CLUB FREDERICTON

Date: 23 November 2018

Dear Greater Fredericton Social innovation:

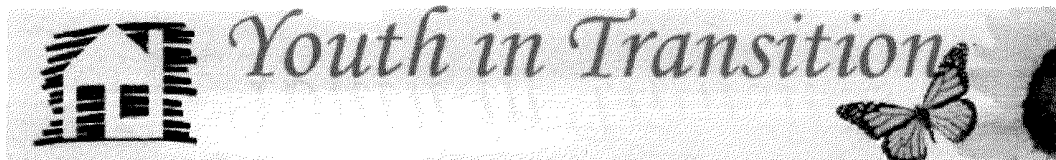
Please accept this letter as confirmation of our interest in moving forward with the Non-profit Data Collaboration project that is part of the City of Fredericton's Smart Cities Challenge.

We believe the ability to link and share information with other data sources and agencies, will help us to better measure outcomes while fostering collaboration.

We look forward to the next steps in this project.

Sincerely,

Jenn Wambolt
Executive Director
Wil-Doo Cycle Club
85-4 Murray Ave
Fredericton NB E3A 3Y7
(506)454-5414
(506)230-3565 cell
jennwambolt@gmail.com



November 30, 2018

Dear Greater Fredericton Social innovation:

Please accept this letter as confirmation of our interest in moving forward with the Non-profit Data Collaboration project that is part of the City of Fredericton's Smart Cities Challenge.

We believe the ability to link and share information with other data sources and agencies, will help us to better measure outcomes while fostering collaboration. We look forward to the next steps in this project.

Sincerely,

A handwritten signature in cursive script that reads "Julie Gallant Daigle".

Julie Gallant Daigle
Executive Director
Youth in Transition Fredericton Inc.

Youth in Transition
P.O. Box 22005, Fredericton, NB E3A 5T6
Phone: 506-451-4767 Fax: 506-458-8856
Website: www.yitfredericton.ca



Human Development Council

Identifies and addresses social issues in Greater Saint John through research, information, coordination and networking.

February 19, 2019

To whom it may concern,

The Human Development Council (HDC) is pleased to support the City of Fredericton and the Road Home team in their efforts to implement the Road Home Digital Platform to address homelessness in Fredericton. As a social planning council that has worked to address social issues, including homelessness, since 1979, we know that cities first need to understand in detail the scope and context of the issue and then coordinate all community resources in order to see a reduction in homelessness.

The Road Home team has set some worthy goals:

- Creating a common data platform for social service providers and increase adoption of a shared Homeless Individuals and Families Information System (HIFIS);
- Compiling data sets and analytics that improve research;
- Creating hundreds of Personalized Inclusion Plans for the most vulnerable people in the priority population segments including women, children, youth, seniors, Aboriginal people, people with disabilities, and newcomers;
- Decreasing average time spent in shelters before accessing permanent housing - from 38 months down to less than ten days;
- Providing support services to maintain housing stability;
- Ending chronic homelessness in Fredericton;
- Reducing cost of homelessness i.e. emergency services - police, fire, shelter;
- Connecting shared data and eliminate barriers to information sharing,

To support the Road Home team and stakeholders in achieving their goals the HDC will provide technical support to entities using HIFIS 4 for a maximum of 4 hours a week for the next 2 years, beginning April 1, 2019 and ending March 31, 2021. We estimate the value of this in-kind contribution to be \$35,000.

The HDC believes that working on these goals will provide community leaders on homelessness with a better understanding of needs, performance tracking and real-time adjustments at the community level. We know that homelessness data analysis is critical for planning and coordination. The Road Home Digital Platform will provide invaluable assistance in the design and implementation of a strategy to end homelessness. We urge you to look favourably on the application.

Yours truly,

Randy Hatfield
Executive Director
Email: randy@sjhdc.ca
Phone: 506.636.5840

3rd Floor- Social Enterprise Hub, 139 Prince Edward St., Saint John, NB E2L 3S3
Main Line: 506-634-1673 • www.sjhdc.ca

September 2018

Smart Cities Canada Jury Members:

Re: Road Home Digital Platform – Fredericton/St. Mary's Smart Cities Challenge

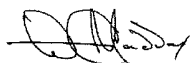
As the homeless serving agencies of the Fredericton area, we are pleased to have entered into a partnership with the City of Fredericton and St. Mary's First Nation as part of the Smart Cities Challenge's Road Home Digital Platform project.

Collectively, we are dealing with resource issues and technology constraints to move our clients along the continuum of care to achieve independence and stable housing. Through the adoption of HIFIS4 (the federal government's Homeless Individuals and Families Information System), we are implementing a shared case management platform to be able to better support and assess client needs, and take a more coordinated and integrated approach in our service delivery.

Through the Smart Cities Challenge, we will reduce barriers for people experiencing homelessness, and help them reconnect to the community. We will realize the following benefits:

- Reduce the need for individuals to re-tell their story to multiple agencies through the adoption of the shared client management system (HIFIS4).
- Enable our agencies to better serve and triage clients based on acuity of needs.
- Allow for more efficient shelter operations.
- Offer a one-stop for enhanced, relevant online resources for shelter residents and first responders (i.e. places for a free meal, laundry service, crisis support, etc.).
- Feed high level, aggregate data to the Digital Community Hub to show if we are moving the needle on reducing homelessness.
- Deploy free, high-speed internet access at homeless shelters as well as computers/kiosks for resident use.
- Upgrade and deploy free, high-speed internet access in public places/City center and on transit.
- Enhance and design new, self-serve personal digital inclusion resources as part of the Digital Community Hub to take more proactive, preventative approach in reducing homelessness.

As the homeless serving agencies of Fredericton, it is our collective vision that in five years, we will see a reduction in the number of people experiencing chronic or episodic homelessness as residents become better connected to the community, and supported in their unique needs.



Warren Maddox
Fredericton Homeless Shelters Inc.
(Grace House, St. John House &
Brunswick Home Transitional Space)



Julie Gallant Daigle
Youth in Transition



John Barrow
John Howard Society of Fredericton

Lisa Edwards
Capital Region Mental Health & Addictions

January 30, 2019

To Whom It May Concern:

I am pleased to provide a letter of support on behalf of the University of New Brunswick for the City of Fredericton and St. Mary's First Nation's Smart Cities Challenge final proposal.

The themes of the proposal surrounding empowerment and inclusion echo, and align with, UNB's mission to provide transformative education for our students. One of the ways we do this is by encouraging our students and graduates to make a significant difference in their communities and around the world by creating opportunities for themselves and for others.

UNB is committed to understanding and solving the problems of today and tomorrow while serving our community. We are actively engaged in truth and reconciliation efforts between Indigenous and non-Indigenous people. We are also partners with the City of Fredericton in a number of meaningful ways, many of which help to make us a smart city. It is inspiring to see the City of Fredericton and St. Mary's First Nation working together in such an intentional manner. We are proud to support this initiative with its ambitious, but achievable goals, of addressing a wide range of critical needs to improve our quality of life.

We are confident that many members of our institute will find themselves actively participating in this project.

Sincerely,



H.E.A. (Eddy) Campbell
President and Vice-Chancellor

UNIVERSITY OF NEW BRUNSWICK
PO BOX 4400 | PO BOX 5050
Fredericton, NB | Saint John, NB
Canada E3B 5A3 | Canada E2L 4L5

unb.ca

H.E.A. (Eddy) Campbell
Professor of Mathematics and Statistics
President and Vice-Chancellor
506-453-4567
president@unb.ca

Jacaban2, Evalynne (INFC)

From: Bell, Adam <Adam.Bell@Fredericton.ca>
Sent: March 4, 2019 2:43 PM
To: SC / VI (INFC)
Subject: Final Proposal - City of Fredericton and Saint Mary's First Nation 3 of 6

The City of Fredericton and Saint Mary's First Nation Smart Cities Challenge video.

Please use the following link [REDACTED]

Password: [REDACTED]

Download button is shown below for your convenience.

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Fredericton Smart Cities Challenge Full Video

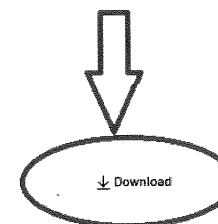
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 Raynemaker Productions PRO [+ Follow](#)

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Leave the first comment:

 Add a new comment



This email is **three** of six that includes the following

1. Final proposal
2. Letters of Support
3. **Finalist Video link to download video**
4. Preliminary Privacy Impact Assessment
5. Response from the Office of the Integrity Commissioner
6. Long text descriptions for accessibility requirements and transcripts

Point of Contact:

Adam Bell [REDACTED]
Assistant Director – Finance, Innovation & Technology
City of Fredericton
335 Queen St.
Fredericton NB, E3B 1B1
Phone: (506) 460-2182
Cell: (506) 478-2234

"Partnering with others to support our organization in making Fredericton the best place to live, work and play."

www.Fredericton.ca

Adam.Bell@Fredericton.ca



Jacaban2, Evalynne (INFC)

From: Bell, Adam <Adam.Bell@Fredericton.ca>
Sent: March 4, 2019 2:43 PM
To: SC / VI (INFC)
Subject: Final Proposal - City of Fredericton and Saint Mary's First Nation 4 of 6
Attachments: Final PPIA Mar 1-19.pdf

Please find attached City of Fredericton and Saint Mary's First Nation Preliminary Privacy Impact Assessment.

This email is four of six that includes the following

1. Final proposal
2. Letters of Support
3. Finalist Video link to download video
4. **Preliminary Privacy Impact Assessment**
5. Response from the Office of the Integrity Commissioner
6. Long text descriptions for accessibility requirements and transcripts

Point of Contact:

Adam Bell, [REDACTED]
Assistant Director – Finance, Innovation & Technology
City of Fredericton
335 Queen St.
Fredericton NB, E3B 1B1
Phone: (506) 460-2182
Cell: (506) 478-2234

"Partnering with others to support our organization in making Fredericton the best place to live, work and play."

www.Fredericton.ca

Adam.Bell@Fredericton.ca



CONFIDENTIAL

Fredericton Smart Cities Proposal: The Preliminary Privacy Impact Assessment

**Robert P. Doherty
Access and Privacy Services
February 18, 2019**

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1. Executive Summary

Introduction

This is a preliminary privacy impact assessment of the Fredericton Smart Cities proposal to Infrastructure Canada's Smart Cities Challenge. It encompasses the overall proposal and each of five pilot projects that have been in the process of conceptualizing and testing their approaches for their projects. This testing involves assessing the service needs of Fredericton's residents, improving service options and their delivery, and improving the overall individual experience across a gamut of areas where residents interact with the city. Because of the substantial amount of personal information collected by the five projects to accomplish these goals and objectives, a privacy impact assessment of how each project plans to collect, use, disclose, retain, and protect the personal information of those citizens participating in each of the projects is needed.

The five projects are:

1. Digital Fredericton
2. Real Time Census/Smart City Dashboard (*As per the Smart Cities Challenge proposal – this project is now called the Digital Community Hub but is known herein as 'Real Time Census/Smart City Dashboard')
3. Doorable (developed by Appdigenous)
4. Non-Profit Data Collaboration
5. Road Home Digital Platform

The ambitious proposal creates privacy challenges for each of these projects as they not only encounter four potentially applicable privacy laws, but also varying degrees of familiarity with privacy principles and use of privacy management tools. The relevant privacy legislative obligations for those five projects are:

1. Digital Fredericton – N.B. Right to Information and Protection of Privacy Act (RTIPPA)
2. Real Time Census/Smart City Dashboard - N.B. Right to Information and Protection of Privacy Act (RTIPPA)
3. Doorable (Appdigenous) – Personal Information Protection and Electronic Documents Act (PIPEDA)
4. Non-Profit Data Collaboration – RTIPPA and the Personal Health Information Protection and Access Act (PHIPA)
5. Road Home Digital Platform – PHIPA and the Federal Privacy Act

This assessment takes into account the privacy obligations of the relevant legislation on each project as it reviews and assesses the privacy compliance requirements of the ten Canadian Standards Association Fair Information/Privacy Principles for each project. It also assesses these projects overall with respect to the seven principles of Privacy by Design developed by Dr. Ann Cavoukian, former Ontario Information and Privacy Commissioner. Further, it reviews the projects overall relative to the letter of the Information Commissioner of Canada and the 12-information and privacy commissioners or their counterparts across all jurisdictions of Canada

sent to the Minister of Infrastructure Canada to express concerns about Smart Cities Challenge Proposals. Finally, the Fredericton Smart Cities Proposal has developed its own set of ten privacy principles to serve as signposts as it moves to ensure privacy compliance for each project.

The assessment of a project's compliance or non-compliance with the ten privacy principles is based on the most current information available on each project. It has been scored on a privacy matrix on the basis of whether non-compliance would cause a potentially serious impact and whether non-compliance would be likely to occur when the project becomes fully operational. Values of one point for a low impact potential or likelihood will be assessed, three points for a medium impact or likelihood, and five points for high impact or likelihood. The two scores are multiplied to produce a relative risk score. Thus, the highest risk would be a 25-point score and the lowest risk would be a score of one.

The results of this assessment's risk scoring and the recommended mitigation strategies to lower privacy compliance risks on each project are provided in summary form at the end of this Preliminary Privacy Impact Assessment.

Privacy Risk Assessment

It is important to note at the outset that the privacy sophistication across a broad band of project stakeholders and management is varied and, in some cases, there is limited (if any) familiarity with privacy principles. All of the projects are familiar with and appear to respect the need for confidentiality of the personal information they keep and collect, but in some, if not many, cases their best practices have not been codified into a privacy management framework with written guidance. This is the situation at one end of the privacy continuum with some projects, and at the other end of the continuum (e.g. organizations such as NB-IRDT and Service Canada's HIFIS4 System, the privacy sophistication is quite high). In the middle of the continuum sits the City of Fredericton which is very cognizant of its obligations with respect to access to information requests under RTIPPA, security in its information technology infrastructure, and the requirement of confidentiality with respect to personal information.

In general, the overall Fredericton Smart Cities Project is assessed as having a privacy risk in the medium range. Certain projects have low privacy risks and certain projects have high privacy risks based on certain inherent risks, their stage of development and commitments to implement recommended mitigation strategies.

The assessment indicates that the highest privacy risks are in relation to the need to develop physical and administrative safeguards for three of the projects. Understandably, plans for information technology infrastructure are in the conceptual stage for these three projects. But with the two City of Fredericton projects (Digital Fredericton and Real Time Census/Smart City Dashboard) there is a significant base of solid privacy and security practices and well-developed privacy and security plans for the projects that are in place. A third project, Doorable, which is an app that is designed to provide assistance to the accessibility community, is in its early stages in the development of such safeguards. Two other projects (Non-Profit Data Collaboration and Road Home Digital Platform) already have robust privacy compliant information technology infrastructure and administrative safeguards that have long been in existence.

With respect to administrative safeguards, the risk is based upon the development and implementation of a privacy management framework for each project. This includes among other things the development and use of a robust consent form and a "necessity" based data element collection form. In the course of preparing this PPIA, templates were developed for use by the various projects, and there is a commitment by the project leads to work with them. However, there is still more work to be done for all projects to develop their own privacy management frameworks based on a suggested mitigation strategy. In a sense the need for administrative safeguards as part of a project's privacy management framework is identified as well under the principles of Identifiable Purpose, Consent, Limiting Collection, Limiting Use and Disclosure, Retention, Access rights for individuals to their own personal information, and Challenging compliance in the broadest sense are part of the Administrative Safeguards privacy assessment, and as will be seen there is a variety of practices and policies, or nothing at all, with respect to these principles. The assessment varies for each project, but the estimated privacy risk has been somewhat lowered based upon commitments of the project leads to develop and implement privacy management framework documents that resolve any deficiencies for these risks.

Also, there is a need for all projects to develop and promulgate policies that provide and inform the public about the individual's right to challenge compliance, i.e. make a complaint either to an organization or to the N.B. Integrity Commissioner.

The project, as noted above, also was examined with respect to Privacy by Design Principles, Guidance from the Privacy Commissioner of Canada and the information and privacy commissioners or their counterparts from all Canadian jurisdictions. The author's review concludes that on the whole, Fredericton Smart Cities has been cognizant of and receptive to ensuring that privacy principles are incorporated into the overall project and each of its projects from the beginning. Each project lead as well has recognized the need to implement certain privacy mitigation strategies to correct any deficiencies that might exist in its approach to collecting, using, disclosing, and securing the personal information that will be involved in their project.

Based on the feedback received from all project leads at this point, RPDAPS is of the view that overall recommended mitigation strategies will be implemented and privacy risks will be lowered upon implementation and access to required resources through Infrastructure Canada.

As per Finalist Guide requirements, the provincial Office of the Integrity Commissioner (OIC) was consulted, provided with copy of this draft preliminary privacy impact assessment (PPIA), and their feedback incorporated within this PPIA noted in italic. Please see their response letter contained in Appendix H.

2. Introduction

Robert P. Doherty Access and Privacy Services (RPDAPS) has been engaged to develop and prepare a preliminary privacy impact assessment (PPIA) for the Fredericton Smart Cities Project Proposal to Infrastructure Canada's Smart Cities Challenge.

The City of Fredericton and St. Mary's First Nation jointly were a successful finalist in the 2018 Infrastructure Canada preliminary round of Canada's Smart Cities Challenge Competition. This Smart Cities proposal, being developed by the Fredericton Smart Cities Task Force, is being considered the competition's \$10-million-dollar category. Its proposal is based on a vision that states:

"Fredericton will collaborate with First Nations to create an accessible, welcoming, supportive city for youth, newcomers, and an aging population empowering everyone with a personalized inclusion plan that connects people to create an exceptional quality of life"

The Smart Cities proposal that encompasses the **Digital Fredericton** transformation initiative with several pilot projects forms the core of its Smart Cities funding proposal:

- **Digital Fredericton**
- **Real-Time Census/Smart City Dashboard**
- **Doorable (Appdigenous)**
- **Non-Profit Data Collaboration**
- **"The Road Home"**

More detail on the overall proposal, and each of the pilot projects will be provided during the course of this preliminary assessment of the privacy risks of the overall proposal, and each pilot project both now and in the future. The PPIA will assess those risks based on the 10 Canadian Standards Association (CSA) Fair Information/Privacy Principles which are as follows:

1. **Accountability**
2. **Identifying Purpose**
3. **Consent**
4. **Limiting Collection**
5. **Limiting Use and Disclosure and Retention**
6. **Accuracy**
7. **Safeguards**
8. **Openness**
9. **Individual Access**
10. **Challenging Compliance**

The assessment under these ten principles will also be complemented by seven principles of "Privacy by Design" which are:

1. **Proactive Not Reactive**
2. **Privacy as the Default Setting**
3. **Privacy Embedded into the Design**
4. **Full – Functionality: Positive Sum Not Zero Sum**
5. **End to End Security: Full Life Cycle Protection**
6. **Visibility and Transparency: Keep it Open**
7. **Respect for User Privacy: Keep it User Centric**

This assessment of compliance with the ten privacy principles will be done in concert with an assessment of the overall compliance of the proposal as well as each individual project with relevant legislation. This will include **at a minimum** the following:

- The Right to Information and Protection of Privacy Act (RTIPPA) and for the City of Fredericton (CoF) and its two projects, i.e. Digital Fredericton and Open Census Data/Dashboard;
- RTIPPA and the *Personal Health Information Protection Act (PHIPA)* for the Non-Profit Data Collaboration Project only;
- (PIPEDA) for the Doorable/ Appdigenous Project;
- The *Federal Privacy Act* and RTIPPA for the "Road Home" Project.

This PPIA has been prepared under the assumption that the N.B. Personal Health Information Act (PHIPA) applies only to the collection of the health card number and medication information collected by Non-Profit Organizations and Homeless Serving Agencies. This is because these organizations meet the definition of "custodian" through their collection of such information from clients and the information collected meets the definition of "personal health information" both through the Definitions Section 1 of PHIPA.

In the case of the NPOs, their collection, use, disclosure, retention and security of that particular information has been carried on since their inception, and is not relevant to the overall purpose of the project except for identifier information as part of the "Crosswalk" process. Thus, their obligations with respect to the health privacy requirements of that information will not be assessed for privacy per se because these obligations and their respect for them already existed prior to Fredericton Smart Cities. As well, their privacy obligations under PHIPA are similar to those under RTIPPA and will be examined in accordance with the CSA's ten privacy principles with legislative obligation references. They will also only be assessed for privacy risks only in the context of the provision of data to the overall Non-Profit Data Collaboration Project.

The same is relatively true of the Homeless Serving Agencies who have been and are under the obligations of PHIPA with respect to the medication, health condition, and health card number information collected from their clients and which will be inputted into the HIFIS4 system. Health privacy obligations with respect to that limited personal health information collected for

referral to health care providers under PHIPA have and will continue to exist for these organizations regardless of any participation in the Road Home Digital Platform.

The homeless serving agencies will be assessed relative to the ten privacy principles which are reflected in relevant legislation.

The Information Technology Infrastructure and Security features of systems are still in the various stages of development for Digital Fredericton, with core implementation established on the Oracle Cloud Platform (see Appendix D).

The Information Technology Infrastructure and Security features of other systems are still in the early stages of development for Real Time Census/Dashboard and Doorable and will be examined with respect to their intentions, and not their current stage of development.

Non-Profit Data Collaboration and Road Home Digital Platform have existing Information technology systems in place in the N.B.-IRDT and in HIFIS4 respectively. Documents relating to assessments and/or the security features of each system have been reviewed for this PIA, but there has not been a technical privacy analysis of the components of each system, as the documents suggest either through legislated or policy obligations that this has already been done by these systems owners. As well any information technology infrastructure associated with the Non-Profit Organizations and Homeless Serving Agencies that are or will be providing personal data to the respective systems has not been assessed for their information technology infrastructure. The security issues for these organizations are addressed in the assessment of their obligations with respect to personal data transfer to IRDT, New Brunswick Department of Health for NPO Collaboration and Service Canada with respect to Homeless Serving Agencies.

It has also been prepared with the assumption that one of its projects (Non-Profit Data Collaboration) is a "non-public body" that is part of a Common or Integrated Service Delivery" project as defined by S. 1 of RTIPPA assuming it is a "person" as defined by S. 38 of the N.B. Interpretation Act and is subject to the provisions of RTIPPA related to such projects.¹ This effectively means that under subs. 46.2 of RTIPPA and relevant RTIPPA Regulations that it is subject to all of the same privacy provisions of RTIPPA as the three City of Fredericton projects. It is possible that there may be some overlap between the applicability of certain provisions of RTIPPA and PHIPA on some projects, but this will be determined during the privacy risk assessments of individual projects.

¹ This assumes that NB-IRDT and the New Brunswick Department of Health are "public bodies as defined by RTIPPA, with NB-IRDT being part of the University of New Brunswick and the New Brunswick Department of Health being a government department. However, it also assumes that the Non-Profit Organizations that have agreed to participate in the project are incorporated meet the definition of "non-public bodies", which under RTIPPA definitions are persons that are not-public bodies. "person" is defined in the New Brunswick Interpretation Act (R.S.N.B. 1973 C. I-13) as "..... a corporation, partnership or society and the heirs, executors, administrators or other legal representatives of a person;

It is also assumed that the organizations involved "Road Home Digital Platform" is neither a "non-public" body nor a "public body" as defined by RTIPPA.² However, as both projects at least in spirit are integrated service delivery projects in the general sense, privacy assessments of their "limiting further use and disclosure" of the personal information will be done according to the tenets of the privacy principle for "limiting further use and disclosure" and the requirements of RTIPPA.

The PPIA will also assess the project's consideration of the Guidance points from the Office of the Privacy Commissioner of Canada (OPC) and information and privacy commissioners, or their counterparts in Canada's 10 provinces and two territories. These were sent to the Minister of Infrastructure in an open letter asking him to consider those points in the selection, design, and implementation of winning proposals as part of the "Smart Cities Challenge" (see the letter at: https://www.priv.gc.ca/en/opc-news/news-and-announcements/2018/let_sc_180424/). As well the PPIA will assess the project's FSC ten privacy principles developed for the FSC Project (See Section 9c). Both will be reviewed in a general assessment. As the ten privacy principles express what basically exists in the legislated requirements of the relevant privacy legislation, the relevant provisions in each privacy law for each project will be noted, but not cited in detail unless they diverge from the obligations expressed by the particular principle.

In using these several privacy signposts to assess privacy risks of the project to ensure a thorough analysis, there will be some overlap and duplication, but where that overlaps and duplication exists, it will be noted in the assessment.

Where privacy compliance risks are identified, they will be rated on how serious the impact would be if the risk was not mitigated along with the likelihood of an incident resulting from an unmitigated risk. The risk level on both of these measures will be based on a sliding scale where a minimum risk receives one point, a medium risk three points, and a serious risk five points. The scoring system multiplies the points for seriousness of impact with those of likelihood of occurrence to determine a relative score and will be expressed in a self-explanatory privacy risk matrix with respect to each of the 10 principles. Thus, a score of 25 points would be the most serious privacy compliance risk under any of the 10 CSA Privacy Principles, and one point would be the lowest risk score. It is important to note that the scoring system only creates a relative privacy risk value in the judgement of the author and is not an absolute value assigned to each privacy risk. It provides a relative privacy risk context for decision makers when considering the need for mitigation strategies to address the risks.

With each identified privacy risk as well, there will be a recommended mitigation strategy to significantly alleviate the risk. There will always be some risk of non-compliance with the 10

² Even if they are incorporated, homeless serving agencies are probably "non-public bodies" as defined by RTIPPA but they do not appear to provide a service in conjunction with a "public body" but rather their collaboration is with Service Canada and its HIFIS System. So, there are no legislative boundaries in homeless serving agencies providing or inputting personal information into the HIFIS System. Service Canada is not a "public body" as defined by RTIPPA, but rather it is a federal government institution whose capacity to use and disclose any personal information received by the Homeless and Individual Families System (HIFIS) is governed by ss. 7 and 8 of the Privacy Act. The bottom line is that the homeless serving agencies are not governed by RTIPPA, but Service Canada is governed by the Federal *Privacy Act*.

privacy principles because of the possibility of inadvertent human errors or malicious actions that expose personal data to unauthorized collection, use, and disclosure. In deciding whether a risk needs to be mitigated, decision makers are left to their own judgment based on the predicted consequences of not mitigating any privacy risk to the degree that is possible.

Most of the Proposal's pilot projects are at the conceptual stage, and thus the assessment will be based primarily on the stated intentions of the project lead. As well, this assessment is based on the best available information provided to the author with respect to privacy compliance by the overall project and the five pilot projects. It also considers future intentions and plans for privacy compliance if and when the City of Fredericton is successful with its proposal for funding. Where possible, the author has personally viewed existing privacy policies, procedures, and protocols. Often however, the assessment is based on the stated best practices of the project's partners and stakeholders, or their plans with respect to future actions. The author takes no responsibility for this information other than to provide the best due diligence possible to determine accuracy of the stated information.

a) Avoiding the Potential Dangers of "Function Creep"

OIC: The goals and objectives of the Fredericton Smart Cities Proposal are geared to provide the citizens and entrepreneurs of the city with better responses to their individual needs, improved service delivery, and greater economic and social opportunities. These are admirable goals, but to achieve them the collection, use and disclosure of personal information will be required to identify needs, develop policies and implement strategies to achieve them. This will not be without privacy risks.

Throughout this document there will be references to limiting the collection of personal information in each of the projects to only that information that is necessary to achieve a project's goals and objectives. There is also frequent discussion of aggregating personal information to provide statistical trends, identification of vulnerable population segments and how to provide more effective responses to their needs, and recording of individual locations by recording the location of their service access or by providing information developed into profiles. Some might see this as "function creep", "Big Brother" or being at the edge of a "surveillance society", the reality is that with proper privacy protections, such phenomena can be avoided.³

While the privacy risks of each of these characteristics for each project are not negligible, it is the authors assessment that the Fredericton Smart Cities Task Force has created sufficient prophylactics or are intending to develop and put them in place to minimize these risks. As will be noted in the various relevant sections of this Preliminary Privacy Impact Assessment, the basis of this minimization is intended to be using privacy tools (e.g. data element template requiring identification of reasons for collection of each data element, robust clear and readable consent forms that allow citizens to control the further use, disclosure, and retention of their personal information, physical, technical, and administrative safeguards, data sharing agreements and clear privacy policies and protocols all periodically monitored and reviewed by a robust governance structure.

³ See "Canadians Are Rightly Worried About Invasion of Privacy in Smart Cities" – The Conversation – Accessed at <https://theconversation.com/canadians-are-rightly-worried-about-invasion-of-privacy-in-smart-cities-110091>

For example, the “Doorable” Project which will initially record locations of accessible doors by accessibility challenged individuals, will have a minimal amount of information collected (e.g. self provided user ID and phone number), and will only have further personal information collected from them to improve service delivery or allow for dialogue opportunities through a thorough and detailed consent form available through a hyperlink to a website.

However, the “proof will be in the pudding” should Fredericton Smart Cities bid for funding from Infrastructure Canada’s Smart Cities Challenge be received. To that degree a Final Privacy Impact Assessment will be needed to ensure that this occurs before any project becoming fully operational.

As well, there will be frequent statements with respect to intentions to aggregate or de-identify data to protect the privacy of individuals personal information, and at the same time provide “bit data” for analysis to identify needs, develop policies, and implement changes in service delivery to improve the lives of citizens. The deidentification of personal information for the Non-Profit Collaboration Project is being done through the “Crosswalk” process developed by the Institute for Research, Data, and Training which is fully described later in that document. Aggregating or deidentifying data on other projects will be done through appropriate and secure software programs that have yet to be developed, but will be guided by principles and protocols of Statistics Canada and guidance from Information and Privacy Commissioners across the country.⁴ Common to all of the guidance is the principle of minimization which means that the fewer data elements there are the easier it is to minimize the risk of identifying an individual.

3. Acronyms and Definitions

Aggregate – information from any of the Fredericton Smart Cities pilot projects that is to be converted to totals of all data in specific data files, but at a minimum must have a cohort of five individuals

Authentication – “Authentication is the process of determining whether someone or something is, in fact, who or what it declares itself to be. Authentication technology provides access control for systems by checking to see if a user's credentials match the credentials in a database of authorized users or in a data authentication server.” Source: [searchsecurity.techtarget.com](https://searchsecurity.techtarget.com/definition/authentication) accessed @ <https://searchsecurity.techtarget.com/definition/authentication>

CSA – Canadian Standards Association

CoF – City of Fredericton

“Crosswalk” Process – A process used by the Government of New Brunswick and NB-IRDT to de-identify and link data, which will be used in the Non-Profit Data Collaboration project:

⁴ See for example “De-identification Guidelines for Structured Data” – Office of the Information and Privacy Commissioner of Ontario and “Disputing the Myths surrounding De-Identification” – CHEO Research Institute and the University of Ottawa – Office of the Information and Privacy Commissioner of Ontario.

- The data custodian splits the data. The agency assigns a random, unique number (the linkage key) to each data point. Then the agency split the data into two files. The file that contains the Medicare numbers and/or other identifying information + linkage key goes to the Department of Health. The file that contains program information/variables + the (same) linkage key goes to the IRDT.
- The Department of Health then creates a crosswalk file by replacing all the Medicare numbers/identifying information in the file they received with a designated institute ID (Every Medicare number in the province has a corresponding institute ID. The Department of Health is the only one who has access to the list of numbers, which is why they will always be the ones facilitating the crosswalk process).
- The database administrator at the IRDT now has two files: the program file, containing program information + linkage Key and the crosswalk file, containing the Designated Institute IDs + the Linkage key. Using the Linkage key, the database administrator "re-attaches" the two files. The re-attached file goes on our platform and contains the Designated Institute IDs + Program information.

The Cloud – ".....is a term referring to accessing computer, information technology (IT), and software applications through a network connection, often by accessing data centers using wide area networking (WAN) or Internet connectivity." Source: SDXcentral.com accessed @ <https://www.sdxcentral.com/cloud/definitions/what-is-cloud/>

Common or Integrated Service Program or Activity (ISD) – "means a service, program or activity that is provided by

- (a) a public body and one or more other public bodies or one or more non-public bodies or
- (b) A public body on behalf of one or more public bodies. Source: N.B. Right to Information and Protection of Privacy Act (RTIPPA) s. 1 – Definitions

Data Matching – "means the creation of identifying information by combining identifying information or de-identified information or other information from two or more electronic databases or two or more electronic records" Source-RTIPPA S. 1 - Definitions

De-identified Information - personal information that has had its identifiers removed and replaced by a linkage key to allow researchers to track, analyze and compare data sets of the same individual

Esri – A supplier of geographic information system software

FSC – Fredericton Smart Cities

FSCTF – Fredericton Smart Cities Task Force

HSA – Homeless Serving Agency

MRA – Municipal Records Authority

NB-IRDT- New Brunswick Institute for Research, Data and Training

NPO – Non-Profit Organization

Non-Public Body - “means a person that is not a public body”

Note under the Interpretation Act S.N.B. 1973 c. I-13 a person is defined as including “... a corporation, partnership or society and the heirs, executors, administrators or other legal representatives of a person” Source: Interpretation Act - S. 38

OIC – Office of the Integrity Commissioner (NB)

Personal Information (PI) “recorded information about an identifiable individual” Source New Brunswick Right to Information and Protection of Privacy Act (RTIPPA) S. 1 Definitions; Personal Information Protection and Electronic Documents Act (PIPEDA) S. 2 Definitions; “means information about an identifiable individual that is recorded in any form.....” – The Privacy Act S. 2 – Definitions – “..... information about an identifiable individual that is recorded in any form”

PPIA – Preliminary Privacy Impact Assessment- a tool used to assess, analyze, and evaluate the privacy risks of a given new or changed project or program and to provide suggested mitigation strategies for those risks.

Public Body – “means

- (i) a department, secretariat or office of the Province of New Brunswick, including but not limited to those portions of the public service specified in Part I of the First Schedule of the Public Service Labour Relations Act,
- (ii) a government body, board, Crown corporation or commission listed under Part IV of the First Schedule of the Public Service Labour Relations Act,
- (iii) a government body,
- (iv) the office of a Minister of the Crown, or
- (v) a local public body”

Note: a “local public body” includes a “municipality” (e.g. City of Fredericton) and an “educational body” (e.g. the University of New Brunswick (UNB) (RTIPPA S. 1 – Definitions)

RPDAPS – Robert P. Doherty Access and Privacy Services

TRA – (Threat Risk Assessment) - A Threat and Risk Assessment analyzes a software system for vulnerabilities, examines potential threats associated with those vulnerabilities, and evaluates the resulting security risks. Source: ModernAnalyst.com accessed @ <https://www.modernanalyst.com/Careers/InterviewQuestions/tabid/128/ID/3011/What-is-the-purpose-of-a-Threat-and-Risk-Assessment-TRA.aspx>

UNB – University of New Brunswick

4. Purpose and Objectives

The Fredericton Smart Cities Project is a global set of five digitally designed pilot projects to engage the citizens of the City and St. Mary's First Nation to respond more effectively to their needs and provide more transparent responses to those needs through research and innovative services. All personal and aggregate information collected through those pilot projects will be collected and used only with consent of the citizens to further those goals⁵, and disclosed in aggregate or de-identified form to the public or project partners to frame policy or economic development.

5. Intended Scope of the Project

The project is ambitious in nature and will involve more than 20 partners in the five projects development overall governance including non-profit agencies, businesses and advisors from the academic community. These will include the City of Fredericton, external Service providers bound by confidentiality agreements, 10 non-profit agencies providing services to citizens, six homeless serving agencies, the New Brunswick Department of Health, the University of New Brunswick through its New Brunswick Institute for Research, Data and Training (NB-IRDT) Service Canada through its Homeless Individuals and Families Information System (HIFIS) platform and data base, Appdigenous a private software developer, and other private sector companies. The scope of the data collected to service the needs of the overall project and the five pilots projects will include personal information collected through ethnographic research, online dialogue, online e-government transactions between citizens and the City of Fredericton (CoF), surveys, program files from homeless serving agencies (e.g. shelters), program files from non-profit organizations serving citizens (e.g. Meals on Wheels), and from Doorable app users (note: Doorable is an app designed for persons with accessibility challenges, see project description in Section 7). It will also involve the aggregation or de-identification of personal data to provide clearer real-time snapshots of citizen market segments of the city to determine where services are needed or service delivery can be improved. As well it will also involve the

⁵ Except data already collected by CoF through ethnographic research and Non-Profit Data Collaboration and Road home which may or may not have collected information with consent

collection of aggregate or de-identified information from real-time census data from Statistics Canada or other open data sources.

Its scope, and privacy issues are complex not only because of the multiple partners and stakeholders involved in the collection and use of personal information, and the aggregation or de-identification of it to protect the privacy of the individuals whose information is, but also because of legislation. Four privacy laws are relevant to one or more pilot projects that are part of the proposal. They include the *Right to Information and Protection of Privacy Act (RTIPPA)* for Digital Fredericton and Dashboard, the *Federal Privacy Act* for "Road Home" and its HIFIS platform/data base, *RTIPPA* and the *Personal Health Information Protection Act (PHIPA)* for "Non-Profit Data Collaboration" among non-profits, the New Brunswick Department of Health, and NB-IRDT, and finally potentially the *Personal Information Protection and Electronic Documents Act (PIPEDA)* for Doorable the project that will provide easier access to buildings through a wireless app that will open doors through smart phone technology.

6. Governance

If and when funding is received from Infrastructure Canada, the Fredericton Smart Cities Project will be governed by the Fredericton Smart Cities Task Force (FSCTF) comprising 15 members outlined below. Meetings will be held quarterly at a minimum, or as required. The primary role of the FSCTF is to act as an advisory one with respect to the progress of the Smart Cities Challenge and its projects. Reporting will be by way of quarterly progress reports including communications and budget. The FSCTF would provide input with respect to issue management, mitigation strategies, change control process – if there are major project/cost deviations, and ensuring data and security compliance requirements are executed (including an annual privacy audit) via the Privacy Sub-Committee.

Fredericton Smart Cities Task Force Composition:

1. Fredericton Smart Cities Task Force Chair
2. St. Mary's First Nation designate (ex-officio)
3. Smart Cities Manager (ex-officio)
4. Fredericton City Clerk / Privacy Sub-Committee Chair (ex-officio)

Five Project Committee Leads representing:

5. Non-Profit Data Collaboration (Greater Fredericton Social Innovation)
6. Road Home Digital Platform (Community Action Group on Homelessness)
7. Dashboard (WSP)
8. Appdigenous (Doorable)
9. Digital Fredericton (City of Fredericton)

Academic, Commercial and Social Oversight:

10. University of New Brunswick

11. New Brunswick Community College
12. Fredericton Public Library
13. Rogers
14. Blue Spurs
15. Deloitte
16. Fredericton Community Foundation
17. Stan Cassidy Centre for Rehabilitation
18. Hotspot Inc.
19. Ignite Fredericton
20. United Way

There will also be a **Privacy Sub-Committee** – chaired by the CoF Chief Privacy Officer (City Clerk for now) or his/her designate and will be comprised of representatives from each of the five project committees, plus a representative from St. Mary's First Nation, a privacy subject matter expert, Virtual Information Chief Security Officer/Bulletproof Security Operations Centre, and a representative each from NB-IRDT and Service Canada. In addition, the Privacy Sub-Committee will be responsible for developing privacy frameworks and their privacy policies, procedures, protocols, consent forms and data sharing agreements as necessary and submitting them for approval to the Board. The Privacy Sub-Committee would ensure an annual privacy audit.

Funding received from Infrastructure Canada for the five projects will be disbursed by the City of Fredericton. The Smart Cities Project Manager will be responsible for maintaining the budget and funding disbursements based on allocations as per the Smart Cities Challenge submission. Quarterly reports - or prescribed reporting format as per Infrastructure Canada requirements - will be presented to the FSCTF by the Smart Cities Project Manager to inform of progress and deviations which could result in change control.

Governance structures for project partners (i.e. NB-IRDT, New Brunswick Department of Health, and Service Canada are long established and firmly in place).

a) Responsibilities

The Clerk of the City of Fredericton or her designate will be responsible for the overall privacy compliance of the Smart Cities Project. Each project lead or their designate will be responsible for the privacy compliance of their project and will report to the Privacy Sub-Committee on all aspects of privacy compliance. Privacy Compliance reports will be submitted to the FSCTF quarterly (or as deemed appropriate) in addition to an annual privacy audit. The governance structure for each of the projects will be developed for each project once Infrastructure Canada funding commitments are received.

7. Project Descriptions, Data Flows, Data Flow Diagrams, and Information Technology Infrastructure & Security

a) Overall Fredericton Smart Cities Project

As part of the City of Fredericton and St. Mary's First Nations submission to the Government of Canada's Smart Cities Challenge, five connected projects are being undertaken. These projects involve more than 20 community organizations, including non-profit agencies, businesses, and advisors from the academic community. Each of the projects will feed aggregate data into the City of Fredericton, and data from four of the projects will be screened and made available on the Dashboard Open-Government online portal.

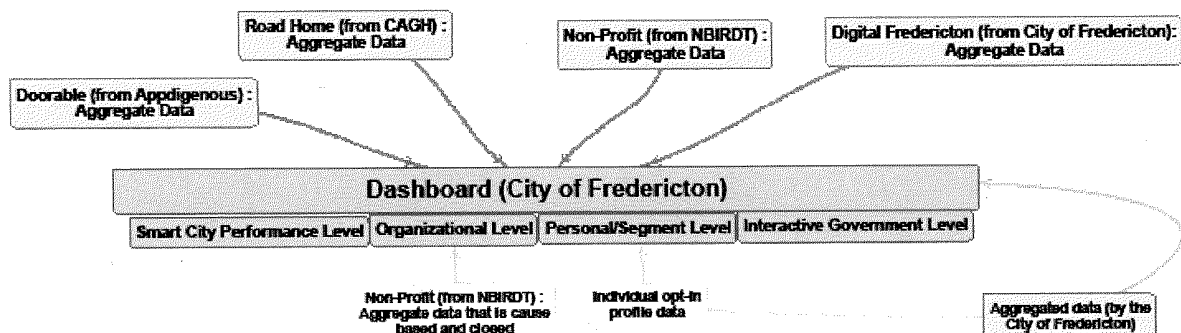
The challenge the submission will aim to address is: "My city **does not recognize me or connect me to what matters most**; Fredericton will collaborate with First Nations **to create an accessible, welcoming, supportive city** for youth, newcomers, and an aging population, empowering everyone with a Personalized Inclusion Plan that **connects people to create an exceptional quality of life.**"

Each of the five projects are aimed at creating enhanced data tools for identifying citizens' unique needs and connecting them to appropriate services and resources that would matter to them.

(i) Data Flow

The City of Fredericton's two projects (Digital Fredericton and Dashboard) will collect personal and aggregate information. However, the only information shared with FSC's partners will be aggregate data through the Dashboard Open Government online portal. The other three projects will also only share aggregate information with the City of Fredericton and in the case of two of the other projects, Doorable and "The Road Home", aggregate data will be provided to the city for placement on the Dashboard "online" open government portal. The Non-Profit Data Collaboration Project's aggregate data will only be shared with the City of Fredericton and local funding agencies such as the United Way and the Fredericton Community Foundation. All personal information collected by the five projects will be used by each project and will remain securely within the cloud platform/data base of the individual project and will not be disclosed to any other organization without the express consent of the individual whose personal information it is.

(ii) Data Flow Diagram



b) Project Description Digital Fredericton

About the project

Digital Fredericton is the City of Fredericton's way of becoming innovative and transparent, open and a government that collaborates with community and focuses on the citizen. There are three key layers to Digital Fredericton:

- **Core implementation** – transforming how the City does its business with standardized and efficient processes by adapting modern systems & IT infrastructures and establishing metrics that matter.
 - The work on core implementation is nearly complete and now the City is turning its attention to the next two layers.
- **E-government/customer experience** – creating a better customer experience for citizens as they connect, engage, and digitally interact with the City.
 - The City is engaging in ethnographic research⁶ to find about what the day-to-day experiences of residents in Fredericton are, what's important to them, and what barriers prevent them from having a great day in the city. The City will do this with all population segments in the community and use the insights to ideate

⁶ Ethnography is consumer research that involves deeper one-on-one interviews in places where the person feels comfortable in order to get better insight on people's motivations and aspirations than simple self-reported data through a survey can provide.

solutions and pilot/prototype new ways to serve the community, which it will take back to citizens for testing before fully implementing.

- Another element of the e-government/customer experience part of the project includes potentially bringing together all the ways a citizen/customer interacts with the City to be able to suggest more services that might be of interest to them and to better enable them to self-serve where possible, freeing up staff time to serve in more customer-facing roles.
- **Connected community** – making data easily accessible, enabling online collaboration and participation from the public and community stakeholders.
 - This layer involves developing partnerships with community stakeholders – such as start-ups and non-profit organizations – to allow them to innovate on the edge, using aggregate data from the City to develop improvements in the community that will help citizens experience life in extraordinary ways. The City will become a living lab for innovative solutions.

Goal/expected results

By 2023, residents will be able to say, “My city recognizes me and connects me to the things that matter most and enables me to experience an exceptional quality of life in extraordinary ways.” The ultimate goal is to improve quality of life in Fredericton for all citizens and drive economic prosperity through new services, innovations and collaborations.

Activities

The City has built a core foundation through the implementation of an enterprise resource planning cloud solution to help focus internal City staff capacity toward customer facing and value add activities. It is also in the midst of piloting its ethnographic research and solution ideating for the older adult segment of the population.

Current and future activities include:

- Developing more customer segment profiles & define opportunities and requirements to enable extraordinary citizen experiences for each segment (based on ethnographic research).
- Developing high-level implementation roadmap of prioritized initiatives that support the Digital Fredericton vision.
- Further developing inventory of internal work that can be better enabled to serve citizens.

- Implementing a Transformation Management Office, establishing governance model and management process for projects.
- Working with Smart City Challenge partners to connect outcomes to Digital Fredericton metrics and dashboard.

(i) Data Flow

Information on “Core Implementation” has been and will be collected by the City of Fredericton on its business processes. It also collects and will collect personal information of its employees for human resource purposes. The information is inputted onto the Cloud Based platform of the City of Fredericton with appropriate security measures that are described under Physical Safeguards later in this PIA. The method of collection is entirely electronic, and consent from employees is obtained during the collection of personal information for human resources purposes. CoF will collect personal information under the “E-Government/Customer Experience” component of this project with the consent of the citizen. This will be done through ethnographic research of city population segments, surveys, and with the online engagement of citizens (with consent) about their service experiences with the city. Information obtained through these exercises will be aggregated for policy and identifying economic development opportunities and, where appropriate, placed on Dashboard, an open CoF government portal to provide citizens and entrepreneurs evidence-based data to improve their opportunities.

(ii) Data Flow Diagram



(iii) Information Technology Infrastructure and Security

See Appendix D.

c) Project Description: Real-Time Census / Smart City Dashboard

About the project

This project involves developing detailed, up-to-date information and data about and for people in the community and their unique “Big Issue” to connect people from all population segments with the services/support they need.

This project will combine data from shared data platforms and disparate data systems to create a Smart City Dashboard with four levels:

- **Smart City Performance Level:** Allowing for transparent measurement of the city based on established smart city indicators.
- **Organizational Level:** Allowing organizations to overlay their own data and determine if they are effective in their service delivery to the community.
- **Personal Need Level:** Allowing individuals access to resources, tools, people and services they need in the areas that matter most to them.
- **Personal / Interactive Level:** Allowing individuals to voice their need and to contribute based on a community need. This may be developing an app or tool to address a community problem, joining or starting a community of interest, voicing needs or contributing open data.

OIC: The project will also use the data gathered from individuals, who opt-in, to offer more personalized information. It will also use this information in de-identified/aggregate form as well as other aggregate information from a number of other sources to create a detailed real-time census based on various customer segments.

As the Globe and Mail pointed out in a recent series on the dearth of data needed to make evidence based decisions and policies constitutes a “data deficit” relative to other OECD countries.⁷ And this “data deficit” exists not only at the national and provincial level, but also at the municipal level as well even in areas where there is currently no or minimal personal information collected.

Essentially, Real Time Census/Dashboard lies at the heart of the Fredericton Smart Cities Proposal in terms of improving the lives of Fredericton’s Citizens. All projects in one way or another feed into the open data portal whose aggregate information will be used to provide a real time snapshot of the city, its population segments, their general areas of residence (or no residence at all), the services that are delivered to them, where the services are located, and deficiencies in the service locations and delivery so that decision makers can adjust, create, and change the liveability of the city for its citizens and entrepreneurs. Dashboard will not only aggregate personal information selected to provide that snapshot through its online portal, but it will deal with geographic and physical attributes of services now delivered as well as uses and deficiencies in the service. For example, on project not part of the current Dashboard, exemplifies what such ‘Big Data’ can do. The location of bus stops did not exist in digital form, and an organization mapped the location, but more importantly indicated for each stop whether there was a shelter and the condition of the shelter. Information from projects such as Road Home Digital Platform will identify in aggregate form the number of homeless individuals,

⁷ Seed “In the Dark: The Cost of Canada’s Data Deficit” by Eric Andrew Gee and Tavian Grant – The Globe and Mail January 26, 2019 accessed at <https://www.theglobeandmail.com/canada/article-in-the-dark-the-cost-of-canadas-data-deficit/> February 18, 2019

performance data for various services and treatments etc.. This in turn will identify how locational services such as hot meal wagons, shelter locations etc. can be better utilized. Ultimately for example, it is possible that there would be real time digital access to the status of available beds in homeless shelters that would be available without making numerous phone calls.

Goal/expected results

- Increased sense of citizen inclusion and participation
- Better informed decision-making supported by citizens' core needs.
- Improve the ability for citizens and organizations to effect change and have a voice in decisions in their community.
- Enable more innovative responses to service delivery.

Activities

The team is currently working on a prototype dashboard for two segments of the population based on user-centred design (older adults and people with mobility-related accessibility challenges). Future activities will include:

- Collecting insights from the ethnographic research conducted through the Digital Fredericton project.
- Establishing datasets to feed into the real-time census aspect of the dashboard and creating process for data identification and refinement.
- Developing a platform for the four dashboard levels.
- Developing an opt-in profile for people who want to provide personal info to personalize the information, resources, and services displayed on their dashboard.
- Conducting user testing of the platform.
- Signing partnership agreements with organizations to provide data to include on the dashboard.
- Creating an engagement survey to be conducted at regular intervals (annual or otherwise).

(i) Data Flow – Dashboard

Dashboard will be an open government online portal that will collect Aggregate data from the Digital Fredericton core implementation data base to measure process performance levels by CoF using Smart City Indicators.

At the “personal need level”, it will also collect personal information from citizens of the city in the course of accessing resources, tools, people and services they need in areas that matter most to them. As well, at the “personal/ interactive level” Dashboard will collect personal information from citizens by allowing them to express their service delivery needs or to contribute to the dialogue around community needs of problems or to communicate within communities of interest. All information will be stored in a secure cloud-based platform that will be developed. The data will be used in aggregate form to create data sets to better inform decision making and improve service delivery by CoF and to provide citizens a transparent online snapshot of their city and how its service needs are being met. It will only be disclosed to the City of Fredericton and ultimately to the public online in aggregate form.

(ii) Data Flow Diagram - Dashboard



(iii) Information Technology Infrastructure and Security

See Appendix D.

d) Project Description – Doorable (Appdigenous)

About the project

Appdigenous is an early-stage technology start-up company focused on designing inclusive technology solutions. Its app, Doorable, is an Internet of Things solution featuring a multi-functional mobile app & custom designed hardware, providing next gen technology for those with accessibility challenges.

The technology was inspired by the difficulty some people with accessibility challenges (e.g. people who use a wheelchair or other mobility aid) have using the existing “push buttons” on

accessibility doors. The buttons are often blocked, awkwardly placed, or simply not easily used by people who have limited mobility in their arms and hands. Market research conducted by Appdigenous as part of the Smart Cities initiative has also revealed that the buttons or accessible doors themselves are often broken and that people with accessibility challenges would value a platform to communicate about accessibility barriers.

The technology will:

- Wirelessly open doors (through a Smartphone/tablet app) without having to push the button.
- Map an accessible city (show which doors are accessible/Doorable-enabled, whether doors are working, as well as where are accessible washrooms, parking, available accessible housing, etc.).
- Allow app users to communicate directly with each other and with facilities about accessibility barriers (this will include the ability to alert a facility whether the user needs assistance getting in the building).
- Build data through interactions between citizens and infrastructure (e.g. count of door opens, use geo-location features for those that opt-in to show around the city) to be better able to identify barriers/gaps in accessibility in the community, and help better inform municipal decisions with respect to accessibility.

(i) Data Flow – Doorable

This project will collect personal information from residents with accessibility challenges through a smart phone app that a minimum will be used to allow these individuals to open accessible doors through tapping their phones. To achieve this, the app will collect a user ID (not necessarily identifying the individual) and the phone number of the phone and store it on a cloud-based platform. At a more sophisticated level, it will allow users of the app to opt in with consent and communicate their accessibility challenges, needs, preferences, and any emergencies around door accessibility to the developer and building owner. At that level, it could also serve as a communication tool between individuals with accessibility challenges and others in the accessibility community, the developer, or the City of Fredericton

The information will at a minimum be used to map accessible door locations around the city. At the more sophisticated level it will be used to determine challenges with accessible doors and provide more immediate response to emergencies (e.g. doors that will not open). Personal information from the user will only be disclosed to building owners, or other members of the accessibility community with the consent of the user. Aggregate information about app use and a door accessibility map, along with statistical

or anonymous data will be disclosed to the City of Fredericton for policy and service delivery purposes.

(ii) Data Flow Diagram – Doorable



(iii) Information Technology Infrastructure and Security

Doorable is in its conceptual stage and its IT infrastructure is in the midst of being developed. It is understood that the development will ensure privacy compliance with the CSA principle of “Physical Safeguards”.

e) Project Description - Non-Profit Data Collaboration

About the project

This project was inspired by the coming together of more than 30 non-profit organizations, which identified that in order to collaborate on shared concerns; there was a need to enable data collection and measurement in the non-profit sector. Corporations and governments have the benefit of using data to best inform the decisions and policies they make, but most of non-profit agencies generally lack expertise in outcome evaluation and measurement. Government departments also currently do not have access to the information related to the frontline services of non-profits, which is a big gap in information for policy development.

Provincial government departments are sharing their data through NB-IRDT, which is one of the most secure data centres in Canada and is subject to the policies and regulations of UNB as well as provincial and federal legislation. A process is followed to ensure that the data is de-identified and that the privacy of personal information is protected.

Open data efforts are also being undertaken at the municipal, provincial and federal levels to increase transparency and enable individuals and organizations outside of government to help solve challenges. Non-profits are currently being left behind in this movement.

This project will build community capacity to collect data, establish measures and integrate with other public data. It will help show NPOs what to measure, how to collect data, and how to combine it with other data that is available to be able to measure efficiency & impact, improve access to funding, and improve services.

This project will allow agencies to access data at a community level through the City of Fredericton's data portal. Secondly, at an individual level through NB-IRDT, it will allow the non-profits to secure aggregate/ anonymous data on the impact of their services which can be cross-referenced with community demographics. You can see more about the process of how data is shared and de-identified through NB-IRDT in this video:

<https://www.youtube.com/watch?v=vUrkcUyFunM>

By enabling community-wide engagement in the use of data and improving how our non-profits collect and use data, it will help NPOs create a greater community impact through more effective and targeted service design, delivery and evaluation, increased partnerships, and have more outcome-oriented funding in order to more effectively address community problems and influence policy development.

(i) **Data Flow – Non-Profit Data Collaboration**

The "Non-Profit Data Collaboration" Project will collect currently existing as well as future program usage personal information from its clients. The current personal information existing in each NPO's individual files was collected in some cases but not all cases through a signed consent form from individuals. While the consent did not spell-out possible research on the data previously obtained from the individual and others like them, it would in the opinion of this PPIA author be a use consistent with the original purpose of collection. More about this will be discussed under the privacy principles of "identifying purpose" and "Consent". Using the crosswalk process, the information will be securely provided (disclosed) in two separate files, a source identification ID (SID) file (containing direct identifiers such as name, sex, age, Medicare #) and a second file called program file containing an individual's program usage information. The first file goes to the Department of Health where it is de-identified and the specific identifiers are replaced with an institute number and a linkage key and is stored in a secure data base. The Program File is provided securely to the New Brunswick Institute for Research, Data, and Training (NB-IRDT) at UNB without identifiers. Each of these two files contains a common linkage key. NB-IRDT will match the program file with the Institute numbered file through the common linkage key to create one file where neither NB-IRDT nor the Department of Health will have access to the total NPO file, nor will either be able to identify the individual whom the file is about.

Researchers can apply to NB-IRDT, Department of Health and data custodians to do current and longitudinal research on the NPO's programs and provide a current view, trends, and other analysis related to the status of individuals accessing programs. Aggregate / de-identified data will be hosted on the City of Fredericton's 'cause-based hubs' (using Esri software) to enable NPO community to link to other data sources and collaborate with similar agencies.

(ii) **Data Flow Diagram – Non-Profit Data Collaboration**



(iii) **Information Technology Infrastructure and Security**

See Physical Safeguards Section and Appendix F.

f) Project Description - Road Home Digital Platform

The Road Home: A Plan to End Homelessness in Fredericton was launched in 2015 as a result of much stakeholder consultation and included shared data management as a key feature to reducing homelessness in the community. Several homeless-serving groups have a data-sharing agreement in place, with a shared informed consent form for clients, allowing them to collaborate on case management for shared clients. However, these agencies currently collect and store their data in separate systems.

The Homeless Individuals and Families Information System (HIFIS) is a data platform created by the Government of Canada. According to Employment and Social Development Canada (now Service Canada), the latest version of the platform, HIFIS4, “is designed to make data integration safe and easy for users. It can be implemented over a wide network and accessed from a variety of Web-enabled devices, such as laptops, smart phones and tablets. Comprehensive user rights, client visibility and confidentiality practices help ensure that the data is not compromised.”⁸

The plan is to expand HIFIS4 across the homeless-serving system to be the technological backbone of a coordinated approach to serving clients. It will be used to track participant access to services and outcomes longitudinally. This can help build unduplicated records and have a common client information database from which to make collective decisions at the program and system levels. By aggregating data from across the system, it will enable a much better sense of needs and track performance at a community level. This will ensure homeless-serving agencies are able to adjust their approaches in real-time, as a community, rather than on a program-by-program basis.

Another part of this project is using a consistent acuity assessment tool (Service Prioritization Decision Assistance Tool or SPDAT) to help determine the appropriate intervention match to service participant’s needs and creating a By-Names List to create a single shared list of clients to be able to triage who are in the highest need of services.

Currently, six Fredericton homeless-serving agencies are moving ahead with adoption of HIFIS4 in order to be able to better coordinate case management of shared clients. Other agencies will be brought onboard over the course of the project.

(i) Data Flow – Road Home

Personal information originally collected by the six homeless serving agencies participating in the program will be securely inputted by them into HIFIS4 to provide homeless individuals in need with a more effective and personalized service delivery and treatment. At an individual level, the information will be used for the homeless serving agencies to offer personalized treatment programs on a prioritized or triaged basis. At the moment while homeless serving agency partners have the ability to share information with the consent of a homeless individual, the sharing cannot easily be done thoroughly or efficiently. HIFIS4 will make this consent and agreement-based information sharing possible electronically.

All personal information (other than that used for personal interactions with individual homeless clients and for sharing with homeless serving agency partners with consent to coordinate program delivery or treatment) will be aggregated on HIFIS4. It will potentially be disclosed in aggregate form to the City of Fredericton and funding agencies. This will allow for performance measurement of the community's homeless serving programs and allow for the development of different approaches to lessen homelessness in the city.

(ii) Data Flow Diagram Road Home



(iii) Information Technology Infrastructure and Security

See Appendix G

8. Privacy Risk Assessment Based upon the 10 CSA Privacy Principles and relevant legislation

a) CSA Principle # 1 Accountability

"An organization is responsible for personal information under its control and shall designate an individual or individuals who are accountable for the organization's compliance with the following principles." –CSA Code of Fair Information Practices

Relevant Legislation

Overall Project – RTIPPA – [subs. 48.1(4)]

Digital Fredericton and Real Time Census/Dashboard –RTIPPA [subs. 48.1(4)]

Doorable (Appdigenous) – PIPEDA (S. 5 and subs. 4.1 of schedule 1)

Non -Profit Collaboration - par.49 (i) (b) PHIPA for personal health information (e.g. health card # and medication); and RTIPPA [subs. 48.1(4)] for Integrated Service Delivery (where applicable), and PHIPA [re health identifiers

Road Home Digital Platform –par.49(i)(b) PHIPA for personal health information (e.g. health card # and medication); Federal Privacy Act (subs. 3.1(2) for Service Canada HIFIS4 System; par.49(i)(b) PHIPA for personal health information

Under RTIPPA, the City of Fredericton is a "public body" which includes a government body, which includes a municipality. As such the "head" of the "public body" for the purposes of RTIPPA is the "person or group of persons designated by law to serve as "head" (see RTIPPA definitions). In turn under Section 6 of RTIPPA the "head" may "delegate a duty or power of the head "under the Act, except the authority to further delegate. In this case, the City of Fredericton by resolution of the municipal council has designated the City Clerk as "head". The Clerk is thus the individual who is accountable for the city's compliance with this principle for the overall project and for the "Digital Fredericton" and "Open Census Data/Dashboard" Projects. Thus, the privacy risk for the city of Fredericton in complying with this risk is minimal in potential serious impact, and likelihood of a privacy incident.

It is understood that Appdigenous (which is developing Doorable) would be subject to the Personal Information Protection and Electronic Documents Act (PIPEDA) when under Section 4 of that Act it "...collects, uses, or discloses" personal information "in the course of "commercial activities". Under Schedule I, subs. 4.1-4.4 Appdigenous is required to designate an individual to oversee the compliance with this principle as well as establishing policies, procedures and practices "to give effect" to the adherence of the ten privacy principles. The project lead for the Doorable will be designated as the individual accountable for "giving effect" to adherence to the 10 privacy principles for Appdigenous. But this has not occurred yet. Thus, until it occurs the

privacy risk for Appdigenous in complying with this risk is medium in terms potential serious impact, and likelihood of a privacy incident during this interim period before the project is activated. Once this appointment is made it will be minimum for both.

Non-profit organizations involved in the "Non-Profit Data Collaboration" project designed to initiate meaningful research and evaluation of performance outcomes are not strictly speaking subject to RTIPPA or any other privacy legislation. However, it would appear that their project is subject to the "common or integrated service delivery" provisions of RTIPPA as a "non-public body."

Under RTIPPA "a common or integrated service, program or activity PPA means a service, program or activity that is provided by

- (a) A public body and one or more other public bodies or one or more non-public bodies, or
- (b) A public body on behalf of one or more public bodies." (See S. 1 – Definitions – RTIPPA)

Thus, as we will see later in this PIA non-profit organizations participating in the Non-Profit Data Collaboration Project will have certain obligations with respect to the principle of "accountability" there are legislated requirements. This is because as a "common or integrated service delivery" "non-public body" (if they are a corporation, society, or other form of organization) they must follow all of the privacy requirements of RTIPPA. Regardless of whether all NPOs meet that definition, Fredericton Smart Cities has decided collectively that all non-profit organizations participating in a project will comply with all of the 10 CSA privacy principles. In doing so, it will be necessary for an individual to be designated as being responsible for privacy compliance under CSA Privacy Principle # 1. At the moment there is a project lead who will most likely fulfill that function as it is presently part of her scope of duties as lead. It is understood that this formal designation will be done once the project is operational, but in the interim, until such designation occurs, there is a medium privacy risk in terms of potential serious impact and likelihood of an incident. As well, it would appear that each NPO has a director, and thus that individual only need be designated as the privacy officer.

Partners in this project are the New Brunswick Department of Health and NB-IRDT. The Department of Health is subject to the Personal Health Information Protection Act, and under Section 49 requires a "custodian" which would include the department, to designate a person responsible "to ensure compliance" with PHIPA and to "establish and implement information practices to facilitate the implementation of, and to ensure compliance with, this Act" (subs. 49(1) 9a) and (b). NB-IRDT is part of the University of New Brunswick which RTIPPA is an "educational body" which is a "local public body" which is "public body" under RTIPPA as defined in the Definitions in S. 1 of the Act. The "head" of the University of New Brunswick for the purposes of RTIPPA is designated either by "bylaw or resolution". It is understood that the Secretary of the University has been designated as the individual responsible for the administration of RTIPPA, and that a position of "Privacy Officer" was established at NB-IRDT for the purposes of ensuring privacy compliance to RTIPPA by NB-IRDT.

A similar "Accountability" compliance situation exists with respect to the "Road Home" Project. The non-profit shelters that will be participating in the project are not subject in the strictest sense to the provisions of RTIPPA. As well, although it is partnering on the project with Service

Canada, it is not subject to the Federal *Privacy Act* either. It is not involved in collecting, using, or disclosing personal information in the course of "commercial activity" and is not subject to *PIPEDA*. In the strictest sense, it is the author's view that it probably is not subject to the "common or integrated service delivery" provisions of *RTIPPA* because its partnership is with a federal government institution. However as noted earlier, Fredericton Smart Cities has decided collectively that all non-profit organizations participating in a project will comply with all of the 10 CSA privacy principles. In this case while there has been a designated project lead on the project who would currently deal with any privacy issues surrounding the potential project, it has not yet been determined that there has been formal designation of an individual being responsible for privacy compliance in compliance with the "Accountability" Principle. In the interim, the privacy risk with compliance with this principle is thus medium in potential serious impact, and likelihood of privacy incident. Once this designation is made when the project becomes operational, the risk will become minimal.

Flowing from the privacy risk assessment of the Accountability Principle is the need beyond defining and promulgating the identification of who is accountable for the overall smart Cities Program is the need for a governance structure to support that accountability. A proposed governance structure for the Fredericton Smart Cities Task Force (FSCTF) has been/will be adopted by the task force and will be put in place once the FSC project becomes fully operational. Each project team plans to develop its own governance structure within the overall task force governance structure. This means of course, a formal designation of the position responsible and accountable for the project's privacy compliance. Since informal governance structures have worked successfully since the beginning of the development of the FSC proposals by the FSCTF, the privacy risk of non-compliance with this principle is low for the City of Fredericton because the RTIPPA head has been openly identified. For the other projects, it is the low end of medium because project leads have been identified as the individual accountable. When the governance structures for the overall project are activated, and project governance structures are approved and activated once the FSC Project becomes operational, this small risk will be substantially alleviated.

Compliance Privacy Risk – Accountability

City of Fredericton

	Impact – High (5)	Impact – Medium (3)	Impact – Low (1)
Probability –high (5)			
Probability –medium (3)			
Probability –low (1)			✓

Compliance Privacy Risk – Accountability

All Other Smart Cities Projects

	Impact – High (5)	Impact – Medium (3)	Impact – Low (1)
Probability –high (5)			
Probability –medium (3)			
Probability –low (1)		✓	

b) CSA Principle # 2 – Identifying Purpose

“The purposes for which personal information is collected shall be identified by the organization at or before the time the information is collected.” – Source: CSA Model Code

Relevant Legislation

Overall Project – RTIPPA

Digital Fredericton and Real Time Census/Dashboard – par. 38(2) (a) RTIPPA

Doorable (Appdigenous) – s. 5 and s. 4.2 of Schedule 1 PIPEDA

Non -Profit Collaboration –subs. 31(1) PHIPA for personal health information (e.g. health card # and medication); subs. 38(2) RTIPPA for Integrated Service Delivery (where applicable)

Road Home Digital Platform – subs. 31(1) PHIPA for personal health information (e.g. health card # and medication); Federal Privacy Act for Service Canada

(i) Overall Project

The Fredericton Smart Cities Project will only collect aggregate information from its projects for analysis leading to improved service delivery to its citizens, and ultimately for some information, inclusion on the City's Smart City Dashboard. Except through its projects administered by CoF staff, it does not collect personal information. Each individual project of the Smart Cities Program will identify the purpose for any personal information collected from the citizens of Fredericton. Thus, the overall project has no specific need to identify the purpose of the aggregate information collected. However, in the interests of transparency and accountability, it will inform its citizens through the Smart Cities webpage of which Smart Cities projects that collect personal information, the purpose of the collection, and what uses and disclosures there will be of that information.

(ii) Digital Fredericton

Digital Fredericton is subject to subsections 37(1), 37(2) and 38(2) of RTIPPA which allow the city to collect personal information if the information relates to and is necessary for one of its services, programs, or activities. Fredericton Smart Cities' Digital Fredericton and Real Time Census Data/Dashboard are deemed to be services, programs or activities under the legislation. The provisions require the City to inform the individual whom the information is about of the purpose for which the information is collected, and the legal authority for the collection of the information.

Digital Fredericton consists of a core element that is designed to improve processes to make the city more effective and efficient in its administration. The only personal information that the core element has collected and will collect is human resources information (e.g. payroll, vacation, sick time, and performance evaluations).

In the e-government/Customer Service component of the project, personal information has been and will be collected through ethnographic research of population segments of the city. Ethnographic research already done as a pilot activity on this component uses a consent form which does not identify the specific purposes for which the information is collected, and only notes that there the consent form gives permission to use recordings of the ethnographic research sessions for "public use, for the purpose of submitting a proposal for the Smart City Challenge" and "for the purpose of improving the designs, products or services being tested. It is the authors understanding that this will be modified to be more in compliance with RTIPPA by including more specifics on the purpose of collection.

A second part of the e-government/customer service component will be the connected community where personal information of citizens will be gathered making data easily accessible, enabling online collaboration and participation from the public and community stakeholders. The personal information (e.g. property tax payments, applications for permits and licences, 311 calls to the city's information desk etc.) that will be used for this project has not yet been defined. Presumably such information already in existence may have not been collected with consent. However, regardless of this, the purpose for which there are plans for its future use would not be "consistent" with the original collection which was related to obtaining an individual service or accessing a particular program. Thus, from a go forward basis, this further new use of the initial personal information should only occur with the informed consent of the individual that identifies the purpose of the collection of the personal information in accordance with the provisions of RTIPPA. While a clear consent form template which includes the opportunity to identify the purpose of the collect has been drafted for editing by the five Fredericton Smart Cities projects, it is not yet in place. The project plans to put such a consent form in place as a mitigation strategy and this will substantially alleviate any privacy compliance risk for this principle.

Thus, with a commitment to such consent being provided that clearly identifies the further uses and disclosures of the personal information that Digital Fredericton has

collected and will collect under the ethnographic research and e-government customer experience of the project, the risk of privacy non-compliance would be medium, until it is completed. The personal information collected internally by the city for human resources purposes has been collected since the inception of the city, and while there is a privacy risk until the consent for the collection is identified, it is minimal.

Compliance Privacy Risk – Identifying Purpose – Digital Fredericton City Human Resources Information

	Impact – High (5)	Impact – Medium (3)	Impact – Low (1)
Probability – high (5)			
Probability – medium (3)			
Probability – low (1)			✓

Privacy Compliance Risk – Digital Fredericton E-Government/Customer Experience and Ethnographic Research

	Impact – High (5)	Impact – Medium (3)	Impact – Low (1)
Probability –high (5)			
Probability –medium (3)		✓	
Probability –low (1)			

(iii) Real Time Census/ Smart Cities Dashboard

A large part of the information collected by the 'Dashboard' open government online portal will be aggregate information, and thus there would be no need to provide an identifying purpose for the collection of the data. However, there will be a substantial amount of personal information collected in the third and fourth levels of the project, i.e. the 'Personal Need Level' and the 'Personal Interactive Level'. For this collection of personal information, it is clear under RTIPPA that at the time of collection the specific purpose of the collection needs to be identified in an informed online consent form at the time of collection. As noted above, there is a draft consent guidance template with opportunities for providing a clear identified purpose for the collection of personal information to be tweaked by each individual project, and this will be used by the City of Fredericton to develop an appropriate consent form. Until this is in place prior to the project becoming operational the privacy compliance risk with respect to the "Identifying Purpose" principle would be medium in terms of potential for serious impact, and the likelihood of non-compliance with the principle.

Privacy Compliance Risk – Real Time Census - Dashboard

Personal Needs/Personal Interactive

	Impact – High (5)	Impact – Medium (3)	Impact – Low (1)
Probability –high (5)			
Probability – medium (3)		✓	
Probability – low (1)			

(iv) Doorable

Doorable is subject to PIPEDA when it collects personal information in the course of “commercial activity”. Under PIPEDA’s S. 4.1 and Schedule 1’s subsections 4.2.1 - 4.2.4, the purpose for which the information is collected shall be identified by the organization at or before the time the information is collected. Like Digital Fredericton and Real Time Census-Dashboard, Doorable intends to provide an informed consent process for both access and use of its basic app to open accessible doors electronically, and to identify accessible needs, preferences etc. As noted above, a draft consent form template has been developed for the overall project. It is understood that the project lead is committed to eliminate the majority of any risk here prior to the project becoming operational by developing a detailed informed consent form that is fully explanatory of the further uses, disclosures, retention and security of the personal information collected. Assuming this commitment will occur, at this point the privacy risk would, like Dashboard, be medium in terms of potential serious impact, and in the likelihood of non-compliance. If such is not done when the project becomes operational, Doorable would not only be at a high risk of non-compliance but would be in contravention of PIPEDA.

Privacy Compliance Risk – Doorable – Identifying Purpose

	Impact – High (5)	Impact – Medium (3)	Impact – Low (1)
Probability –high (5)			
Probability – medium (3)		✓	
Probability –low (1)			

(v) Non-Profit Data Collaboration

Non-Profit Organizations serving the needs of the residents of Fredericton (e.g. Meals on Wheels) are not subject to any legislation per se. However, in the design of the Non-Profit Data Collaboration project with partners the New Brunswick Department of Health

and NB-IRDT, the non-profit organizations are subject to the Common or Integrated Service Delivery Provisions of RTIPPA. This requires adherence to certain use and disclosure provisions of RTIPPA including information sharing agreements in Sections 46 and 47 of RTIPPA. For the Department of Health and NB-IRDT are subject particularly with respect to data matching with S. 57 of PHIPA and S. 46.3 of RTIPPA for NB-IRDT. These will be discussed later in this PIA under "Administrative Safeguards". As well, at the outset of the project, existing file information will be provided through the process already described to the Department of Health, and NB-IRDT in accordance with a data sharing agreement not yet in place. This transfer, in the author's view, is a use and disclosure that is consistent with the purpose for which the information was originally collected, and thus no consent form with an identifying purpose is needed under RTIPPA. As well (as already noted earlier), the Privacy Sub-Committee of the Fredericton Smart Cities Task Force has agreed that when the project becomes operational, an informed consent form with a clear identifying purpose will be used for all new personal program information collected by these Non-Profit organizations. It has not yet been determined that each of these organizations currently use an informed consent form to collect personal information from clients of its programs, but it will be required in the future for any NPO that will take part in the non-profit data collaboration program. Also, data sharing agreements will be required for any data provided for de-identification to Department Health and NB-IRDT.

Although the use of consent forms by NPOs has not yet been fully determined, and the fact that there is anecdotal evidence of at least an intake form and some consent forms, the author believes that current practices of respecting confidentiality will place these organizations at the low end of medium privacy risk of non-compliance with the principle.

Privacy Compliance Risk – Non-Profit Data Collaboration – Identifying Purpose

	Impact – High (5)	Impact – Medium (3)	Impact – Low (1)
Probability – high (5)			
Probability – medium (3)			✓
Probability – low (1)			

(vi) Road Home

The non-profit homeless serving agencies (e.g. shelters) are not subject to any privacy legislation per se. However, because they will partner on this project with Service Canada through HIFIS4, the personal information that they collect will, for Service Canada, be subject to the Federal Privacy Act. Under that legislation, Service Canada requires all homeless serving agencies to sign a service agreement that requires users to follow standard privacy practices. There is a standard consent form used by homeless serving agencies that allows information sharing with partner agencies but it

currently does not provide a statement of specific identifiable purposes for the sharing, although it may be obvious.

Regardless, there is a need for use of an informed consent form with an identifiable purpose included by each homeless serving agency that is consistent with the thoroughness of consent forms based on a consent form template for each of the Smart Cities Programs projects. That form should specifically identify the purposes of collection, the specific intended uses, current and future disclosures, the period of time which the information will be retained, the security around the information generally, and the ability to revoke consent for such activities at any time. As well, the consent form should provide for a review by the client annually for their continued consent at the earliest point of contact.

Anecdotal evidence of current practices and current partnership arrangements with a privacy conscious Service Canada, and the fact that there is no legislated requirement with respect to identifying purpose, the author believes that current practices would place these organizations at the low end of medium privacy risk of non-compliance with the principle. That is to say that the seriousness of a potential impact is low, although the likelihood of a non-compliance risk is medium.

Privacy Compliance Risk – Road Home – Identifying Purpose

	Impact – High (5)	Impact – Medium (3)	Impact – Low (1)
Probability –high (5)			
Probability – medium (3)			✓
Probability – low (1)			

c) CSA Principle # 3 – Consent

“The knowledge and consent of the individual are required for the collection, use, or disclosure of personal information, except where inappropriate.” – Source: CSA Code of Fair Information Practices

Relevant Legislation

Overall Project – RTIPPA ss. 44-46.1

Digital Fredericton and Real Time Census/Dashboard – ss. 44-46.1 -RTIPPA

Doorable (Appdigenous) – PIPEDA ((s. 5 and subsection 4.3 of Schedule I, and subs. 6.1)

Non -Profit Collaboration – ss. 17-24 PHIPA for personal health information; RTIPPA SS. 43-47) for Integrated Service Delivery (where applicable), and PHIPA re health identifiers

Road Home Digital Platform – ss. 17-24 PHIPA for personal health information; Federal Privacy Act (ss. 7 -8) for Service Canada

(i) Identification of Consent Issues

a) Digital Fredericton and Dashboard

It is the intention of the Fredericton Smart Cities Program that generally its projects will be consent based. From anecdotal evidence it appears this may not be true initially for the Non-Profit Data Collaboration and Road Home Digital Platform projects, as in the beginning they will be collecting existing personal information and it would appear only some NPOs and homeless serving agencies have complete informed consent forms. Because the information will be used and disclosed for a purpose consistent with the original purpose of collection in accordance with sections 44-46 of RTIPPA, RPDAPS concludes that for existing data, consent will not be an issue. However, it has been agreed that on a go-forward basis, that thorough informed consent will be obtained by the Non-Profit Organizations providing services to citizens, and homeless serving agencies(shelters) providing shelter and other assistance to homeless individuals. This will be done by developing an informed consent form using the draft consent form template developed for the FSC Project. Other than these two projects, the remaining three projects (Digital Fredericton, Real Time Census Data/ Dashboard, and Doorable (Appdigenous) will develop a detailed but concise informed consent form that will require agreement from the individual whose information is being collected prior to the time of collection.

Consent is not an issue for the collection of aggregate information by the overall project to allow for policy development, improved service delivery, and transparency about the state of the city with respect to service delivery.

The consent issues for CoF will arise in balancing the need for a consent form that provides a clear view of the purposes of the intended collection, use, disclosure, security, and retention of the individual's personal information. In the e-government/customer service component of Digital Fredericton, this will be challenging. The City of Fredericton has a large data set for individuals who have a transactional or contact history through online experiences with the city. The intention in the e-experience/customer service component of Digital Fredericton to link these interactions to provide more improved service delivery options for such things as payment of property taxes, seeking permits, registering for recreational programs etc. is an objective that is in tune with the overall goals of FSC. However, without initially limiting the potential data linkages to a confined number of obvious service delivery options, there is a substantial privacy risk associated with a potential "Big Brother" effect in terms of the city knowing too much about its citizens, contrary to privacy

principles of allowing citizens to control the further use of their personal information. Secondly, the consent for such an approach needs to be specific in terms of further use and disclosure of the personal information and the purposes associated with it. Without informed consent use of such data sets would be contrary to RTIPPA in the strictest sense, as the information would not have been collected for the purposes which the component would plan on using it or disclosing it.

As well, the consent form for the Dashboard Project will note that the intention would be for personal the information collected retained for as long as the individual continues to participate in ethnographic research or provide online feedback on service needs. The reasoning of the project is that this indefinite retention is necessary to provide improved relevant service identification and delivery in the context of the individual's recorded experience and dialogue with the city. While this is an understandable approach to a retention period given the dynamics of the project, it does run contrary to thinking in privacy circles that the validity of consent should not be for an indefinite period of time. The solution to this issue, in the opinion of RPDAPS, is to provide a continuous opt-in/opt-out option with each service allowing the individual to review what they have consented to, and that they may revoke their consent at any time. The City of Fredericton has agreed to do this, considering this commitment, even with the seriousness of the privacy issues here, the privacy risk of non-compliance would be medium. As well, CoF has agreed that its retention policy over time will follow the retention and destruction schedules of the principle of "Retention".

It is understood that Doorable will develop a consent form for users with two components. The first will be for basic participation as a user of the app, and users will be told that only their user ID and phone number will be collected, what it will be used for, and "except as authorized or required by law" will only be disclosed with the personal information of other app users in aggregate form to the City of Fredericton or other partners. A second consent form component will allow the user to opt-in and provide the app with their accessibility challenges, needs, comments on the accessibility doors etc., and communication with other members of the accessibility community. Users will be asked to check the boxes on which they wish to provide their consent for the use and disclosure of their personal information. In both consent forms, the consent will be given with a simple "I consent" or "I agree" to the uses and disclosures identified on the boxes checked. If this is implemented once the app becomes operational the privacy risk with respect to consent will be substantially mitigated. Doorable has committed to implement this mitigation strategy. With this commitment because of the project being at its early conceptual stages, and importance of consent being needed in dealing with further use and disclosure of the personal information of persons with accessibility challenges, the privacy risk would be medium.

On the other hand, the Non-Profit Data Collaboration Project and Road Home Digital Platform will initially be providing existing personal information to NB-IRDT and the Department of Health in the case of the former, and to Service Canada's HIFIS4 system in the case of the latter. The Road Home is not strictly speaking subject to any privacy

legislation, but its partner Service Canada is subject to the Privacy Act. Non-Profit Data Collaboration, because it connects with NB-IRDT and the New Brunswick Department of Health, is subject to the "Common or Integrated Service Delivery provisions of *RTIPPA*. *RTIPPA* does not require consent to be administered by the NPOs because further use and disclosure is consistent with the original purpose of collection, and presumably the reason for the collection is identified formally or informally at the time of intake. The Federal *Privacy Act* requires consent for further use of personal information collected (in this case by the homeless serving agencies, except where the information will be used for a purpose consistent with the original collection which it would be in this case).

So, in short, while both projects provide data to partners for research or further use and disclosure to assist their clients, there is not a consent requirement for further disclosure. Having said that, the principles and provisions of *RTIPPA* (ss. 44 and 45), *PIPEDA* (Principle 4.5 of Schedule 1), and the Federal Privacy Act (subs.8 (1) would allow a further use and disclosure without consent where both are consistent with the original purpose if they had applied. However, in the interests of proceeding in the future in accordance with the principle of consent, it would be recommended that future personal information collection both projects on a "go-forward" basis should be done with specific consent. A thorough informed consent form may already be in use by both projects, but this has not yet been determined.

There are a variety of consent forms or none at all used by both projects. At any rate, the privacy risk for both projects at this point is minimal because of the further consistent use and disclosure of the personal information. In the future all agencies of both projects are committed to the use of a thorough, informed consent form working with the draft consent guidance (**See attached Appendix A**)

(ii) Privacy Risks of non-compliance re: Consent

Digital Fredericton, Dashboard, and Doorable - Consent

	Impact – High (5)	Impact – Medium (3)	Impact – Low (1)
Probability –high (5)			
Probability – medium (3)		✓	
Probability – low (1)			

Non-Profit Data Collaboration & Road Home Digital Platform - Consent

	Impact – High (5)	Impact – Medium (3)	Impact – Low (1)
Probability –high (5)			
Probability – medium (3)			
Probability – low (1)			✓

d) CSA Principle # 4 - Limiting Collection - The “Necessity Test”⁹

“The collection of personal information shall be limited to that which is necessary for the purposes identified by the organization. Information shall be collected by fair and lawful means.”
– Source: Model CSA Code

Relevant Legislation

Overall Project – RTIPPA (subs.37 (3))

Digital Fredericton and Real Time Census/Dashboard – RTIPPA (subs. 37(3))

Doorable (Appdigenous) – PIPEDA (S. 5 and subs. 4.4 of Schedule 1)

Non -Profit Collaboration – PHIPA (subs. 29(b) for personal health information; RTIPPA (subs. 37(3))

Road Home Digital Platform –subs. 29 (b) for personal health information; Federal Privacy Act (S.4) for Service Canada

All Projects

In essence, ensuring adherence to this principle requires identification and justification up-front prior to the collection of personal information as to why certain personal data elements are necessary for each project. The Fredericton Smart Cities Program in the Digital Fredericton and Dashboard projects and Appdigenous for the Doorable project all face this challenge. In the case of personal information collected from staff in “Digital Fredericton” it is presumed that because of the collection of the information for specific purposes such as payroll, benefits, and performance evaluations since the inception of the city, that only necessary personal information is collected for human resources staff and management to do their jobs.

The ethnographic research items such as video recordings where personal information is collected do not appear to have been measured for the “necessity” test. While video recordings may have been and continue to be necessary for the achievement of the project’s goals, it is

⁹ OIC: It should be noted that for Digital Fredericton, Dashboard, and Non-Profit Collaboration under subs. 4.2.(1) an unauthorized collection, use, disclosure, or disposal of personal information in the custody or under the control of a public body would under RTIPPA constitute a privacy breach and would trigger the investigation, reporting, and notification requirements of subs. 4.2 of RTIPPA Regulation 2018-24.

something that should be reviewed. As well, other collection of personal information by both projects does not appear to have been tested for “necessity”. Thus, until all data elements of both projects have been tested for “necessity” prior to the project becoming *fully operational (i.e. after testing OIC)*, the privacy risk of non-compliance with this principle would normally be considered as high for both projects. However, it is understood that before either project becomes operational, that all personal data elements will be tested for “necessity” using a version of the draft data element template (**See Appendix B**) and this commitment lowers the privacy risk to medium. When this is done, the privacy risk of non-compliance by these projects with this principle will be substantially mitigated further.

Non-Profit Data Collaboration and Road Home already have existing personal data sets that have been collected and are already being used to provide services.

Presumably, the Non-Profit Data Collaboration project’s organizations only collect personal information necessary to deliver programs and services. The association with NB-IRDT and the New Brunswick Department of Health as part of the “Crosswalk” process to allow personal information to be identified and used for research purposes goes a long way to ensuring that this will be the case. As well supporting policies, principles and approaches used by both organizations to capture only essential personal data for de-identification suggest that ensuring that only “necessary” information for research will be captured. RPDAPS has thoroughly examined the privacy policies and procedures of NB-IRDT and is satisfied that any risk of non-compliance by this project is minimal both in terms of potential serious impact and likelihood of a non-compliance occurrence. *OIC: However, on a go forward basis, it is recommended that each data element be reviewed for future collections on the same basis as other projects.*

Road Home in its partnership with Service Canada and use of the HIFIS4 System would be bound by the Federal data limitations that Service Canada would have been subject to when the system was created. A thorough review of the personal data collection and security policies published by Service Canada with respect to HIFIS4 indicates that this is indeed the case¹⁰. The privacy risk there would be minimal in terms of potential serious impact and likelihood of non-compliance with the principle. *OIC: However, on a go forward basis, it is recommended that each data element be reviewed for future collections on the same basis as other projects.*

For the privacy risk to be mitigated for Digital Fredericton and Dashboard’s collection of personal information, RPDAPS offers two possible mitigation strategies. First, a data element template should be used *prior to the initiation of any project (OIC)* whereby the project leads or their designates list each of the data elements that will be collected from citizens, the purposes for the collection, and why the collection of the personal data element is necessary. CoF is committed to use a draft data element template (See draft data element template – Appendix B). These will be evaluated by the Smart Cities Privacy Sub-Committee. Second, there will be a commitment by the FSCTF Privacy Sub-Committee to annually review these documents and how the data elements have been used. With this commitment, the privacy risk for non-compliance by these two projects would be medium. Once the data element “necessity” test is

¹⁰ On line policies suggest this is the case, but the actual PIA on HIFIS has not been reviewed.

completed and reviewed prior to both projects becoming fully operational, the privacy risk for this principle will be substantially mitigated.

The Doorable project is in a similar situation to Digital Fredericton and Dashboard, and the privacy risk for non-compliance with this principle would be medium as well. Mitigation of the risk would be completely successful if the strategy noted above was implemented.

Limiting Collection - Digital Fredericton, Dashboard, and Doorable

	Impact – High (5)	Impact – Medium (3)	Impact – Low (1)
Probability – high (5)			
Probability – medium (3)		✓	
Probability – low (1)			

Limiting Collection – Non-Profit Data Collaboration and Road Home Digital Platform

	Impact – High (5)	Impact – Medium (3)	Impact – Low (1)
Probability – high (5)			
Probability – medium (3)			
Probability – low (1)			✓

e) CSA Principle # 5: Limiting Use and Disclosure, and Retention of Personal Information

“Personal information shall not be used or disclosed for purposes other than those for which it was collected, except with the consent of the individual or as required by law. Personal information shall be retained only as long as necessary for the fulfillment of those purposes.” – Source: Model CSA Code

“Personal information shall be retained only as long as necessary for the fulfillment of those purposes.” –Source: Model CSA Code

Relevant Legislation

Overall Project – RTIPPA (ss. 43-47.1, and 48, 1)

Digital Fredericton and Real Time Census/Dashboard –RTIPPA (ss.43-45 use, 46- 48.1, 48.1 disclosure, and 48.1(2) and (3)) and RTIPPA regulation subs. 4.2(6) Retention

Doorable (Appdigenous) – PIPEDA (S. 5 and subs. 4.5 of Schedule 1, and *Division 1.1 and definitions Digital Privacy Act (OIC)*)

Non -Profit Collaboration – PHIPA for personal health information ss. 32-34 for use, ss. 35-46 for disclosure, and S. 55 for retention; Regulation 2018-24 S. 4.1 re Common or Integrated Service Delivery information sharing agreements; RTIPPA ss. 43-45 and 48.1 for Retention)

Road Home Digital Platform – PHIPA for personal health information ss., 32-34 for use, ss. 35-46 for disclosure, and S. 55 for retention; Federal Privacy Act (subs. 6(1), S. 7 and 8) for Service Canada¹¹

(i) Limiting Use and Disclosure of Personal Information – All Projects¹²

Privacy legislation generally takes the approach in dealing with principle that unless an organization has consent it should only use and disclose personal information for the purpose for which it was collected or a consistent purpose, and that you should not disclose it to another individual or organization with consent unless you have a designated permission in the law. The most common examples in the legislation for legislated permissible disclosures would be for law enforcement investigations or for the health and safety of an individual or group of individuals.

In the case of Digital Fredericton and Dashboard, it is the intention of those project committees to limit further use and disclosure of any personal information in accordance with a carefully crafted thorough informed consent form. The same is the expressed intention of the Doorable Project Team. Although intentions are not actualities at this point, the privacy risk of non-compliance on this part of this principle would be medium based on those commitments for all three projects. However, once each of these projects becomes operational and that privacy strategy is followed, the risk will be minimized.

The Non-Profit Data Collaboration Project at the moment does not have specific limits placed on the further use and disclosure of personal information noted in the consent form, but they do have limits based on past practices. There will be a required information sharing agreement with NB-IRDT and New Brunswick Department of Health mandated by RTIPPA (subs. 46.2 and S. 4.1 of Regulation 2018 -24) for common and integrated service delivery project as defined S.1. They are also committed to developing and implementing a consent form based on the consent form guidance prior

¹² OIC: It should be noted that for "Digital Fredericton", "Dashboard", and "Non-Profit Collaboration" under subs. 4.2.(1) an unauthorized collection, use, disclosure, or disposal of personal information in the custody or under the control of a public body would under RTIPPA constitute a privacy breach and would trigger the investigation, reporting, and notification requirements of subs. 4.2 of RTIPPA Regulation 2018-24. For Doorable, privacy breach requirements would be triggered for "the loss of, unauthorized access to or unauthorized disclosure of personal information resulting from a breach of an organization's security safeguards that are referred to in clause 4.7 of Schedule 1 or from a failure to establish those safeguards". For "Road Home Digital Platform", there are no specific legislative provisions in the Privacy Act with respect to breach notification.

to the project becoming operational. Under these circumstances and future commitments, the privacy risk will be at the low end of medium – medium in terms of potential serious impact and low in terms of likelihood of occurrence.

The Road Home Digital Platform would presumably have limits placed on further use and disclosure of any information through consent forms or information sharing agreements between and among the homeless serving agencies. However, this has not yet been determined that this is the case, and until it is, the privacy risk of non-compliance would at this point normally be high. However, it is understood that there is a commitment to ensure that this is the case, and if it is not, to put in the appropriate limitation in the privacy management frameworks of these non-profit organizations.

The Non-Profit Data Collaboration Project would also presumably have limits placed on further use and disclosure of personal information noted in a consent form and an information sharing agreement with NB-IRDT and the New Brunswick Department of Health mandated by RTIPPA (subs. 46.2) for a common or integrated service delivery project as defined in S. 1. It is understood that such an agreement is being drafted and will deal with this issue. At this point, this has not been verified, and needs to be verified and reviewed. However, because of the stated policies of IRDT and the legislated requirements and past experience with data matching projects by N.B. Health the privacy risk of “non-compliance for this principle would at this point be considered medium.

However, as noted above, for all of these projects, it is understood that the project leads are committed to developing consent forms that identify limits on further use and disclosure of personal information as well as privacy policies, and other administrative safeguards to achieve the same purpose. Under this assumption the privacy compliance risk would be considered medium. Should these two projects not fulfill that commitment prior to becoming fully operational, the privacy risk would be high. Once this has been done, the privacy risks of non-compliance with this principle would be minimized.

Privacy Compliance Risk – Limiting Use and Disclosure – Digital Fredericton, Dashboard, Doorable, Road Home Digital Platform, and Non-Profit Data Collaboration

	Impact – High (5)	Impact – Medium (3)	Impact – Low (1)
Probability – high (5)			
Probability – medium (3)		✓	
Probability – low (1)			

(ii) Retention

The City of Fredericton currently adheres to the records classification, retention, and destruction schedules and policies of the Municipal Records Authority *under the auspices of RTIPPA regulation 2018-24 subs. 4.2(6) (OIC)*. CoF has indicated that it will follow the records classification, retention and destruction schedules and policies of MRA for records created under the Digital Fredericton and Real Time Census/Smart Cities Dashboard. Under this assumption and the commitment to check in online periodically with each individual (noted above) regarding their continuing participation with FSC, the privacy risk for those two projects would be minimal.

As the City of Fredericton moves into “modern” business operations, the organization will move away from traditional records management and move towards information management. Its role remains “stewards to public information” ensuring it’s organized, classified, managed and easily retrievable. The City Clerk carries the accountability for the organization.

The City of Fredericton advises that the MRA is somewhat dated (written originally for paper records) but can be used to manage data of the same kind as traditional records.

It is understood that Government of New Brunswick is creating an information management policy that will be extended to municipalities that will complement the MRA legislation already in place and address records of a digital nature.

Doorable is an FSC project in its early stages. As such, it has not yet prepared written privacy management framework policies, protocols, and procedures that will provide guidance to the organization on the collection, use, disclosure, retention and security of personal information. Doorable’s project lead has committed to preparing such privacy management documents, including a records retention policy consistent with the MRA, for review by the Privacy Sub-Committee prior to becoming operational. Despite the lack of such a record retention policy at this stage, this commitment means that the privacy risk for non-compliance with this principle is medium at this stage. If such a policy is not prepared before the project becomes operational, it would result in a high-risk in potential serious impact, and likelihood of non-compliance with this principle.

Road Home’s participation in the HIFIS4 System means that client personal information entered into and accessed from the system according the systems user agreement privacy requirements would place its personal information under the retention policies of Service Canada. A brief review of existing documents relative to HIFIS indicates the privacy consciousness of Service Canada with respect to the system would strongly indicate that solid record retention policies are in place at Service Canada because of Government of Canada requirements in this area.¹³ Thus for Road Home, the privacy risk with respect to the Retention Principle is minimal.

¹³ Under the Treasury Board Secretariat’s [Directive on Recordkeeping](#) each government institution is responsible for “establishing, implementing and maintaining retention periods for information resources of business value.” It is incumbent upon each government institution to understand and apply generally any

Through the crosswalk process, NPOs participating in the Non-Profit Data Collaboration provide their program file identifiers and a linkage key for each individual client to the New Brunswick Department of Health which de-identifies that information and creates an institution number. The participating NPOs also provide program usage information on each client with a linkage key to NB-IRDT without any identifiers of the clients. The Department of Health transfers the client institutional numbers and corresponding linkage keys to NB-IRDT and thus neither the Department of Health nor NB-IRDT have the total file of personal information about the client, and the client is completely de-identified. The records retention policies governing the files are those of NB-IRDT and the Department of Health. A review of the privacy compliance information made available by NB-IRDT indicates that (pursuant to RTIPPA's ss. 46(1.1)-48.1) it would have robust and clear records retention policies for the personal data it would receive pursuant to a tri-party data sharing agreement (NPO/Department of Health/NB-IRDT). The Department of Health is governed by subs. 55(1) of PHIPA with respect to records retention requirements. Although NPOs will continue to maintain personal information files of its clients, their records retention practices for these records appear to be based upon, and will continue to be based upon, the requirement to maintain files for as long as the NPO considers the file active. Because the project principally consists of a document transfer under secure conditions to two other organizations, RPDAPS has only examined the evidence or obvious legislated obligations with respect to retention for NB-IRDT and the Department of Health. Fredericton Smart Cities will offer assistance if requested with respect to retention policies for these NPOs, but it has not reviewed the status of retention policies and practices as these would continue regardless of their participation in the project.

Privacy Compliance Risk – Retention – Digital Fredericton, Dashboard

	Impact – High (5)	Impact – Medium (3)	Impact – Low (1)
Probability – high (5)			
Probability – medium (3)		✓ ¹⁴	
Probability – low (1)			

Privacy Compliance Risk – Retention – Non-Profit Collaboration and Road Home Digital Platform

	Impact – High (5)	Impact – Medium (3)	Impact – Low (1)
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legislation regarding the retention and disclosure of information and more specifically its own legislation when setting those retention periods.

¹⁴ For internal process records of CoF, the risk however would be minimal for "Digital Fredericton" because it already follows thermal Classification and retention and destruction schedules.

Probability – high (5)			
Probability – medium (3)			✓
Probability – low (1)			

Privacy Compliance Risk – Retention – Doorable

	Impact – High (5)	Impact – Medium (3)	Impact – Low (1)
Probability – high (5)			
Probability – medium (3)		✓	
Probability – low (1)			

f) CSA Principle #6 – Accuracy

“Personal information shall be as accurate, complete, and up-to-date as is necessary for the purposes for which it is to be used.” – Source: CSA Model Code.

Relevant Legislation

Overall Project – RTIPPA (s. 39)

Digital Fredericton and Real Time Census/Dashboard –RTIPPA (s.39)

Doorable (Appdigenous) – PIPEDA (S. 5 and subs. 4.6 of Schedule 1)

Non -Profit Collaboration – S. 53 PHIPA for personal health information; and RTIPPA for Integrated Service Delivery.

Road Home Digital Platform –S. 53 PHIPA for personal health information; Federal Privacy Act (subs. 6(2) for Service Canada’s HIFIS4

General – Overall Program and All Projects

Generally speaking the legislation or the principle requires approaches to ensure that the personal information provided by individuals to the Fredericton Smart Cities Project to be kept current, especially if it is continuously being used. It is understood that the vast majority of the personal information collected by each project will be used continuously either in analysis of aggregate data, or to identify service needs or for dialogue with citizens to improve their service experiences with the city. All of the personal information collected will be located on secure information technology platforms or in locked file cabinets. It will be collected specifically by each project. For some of the projects such as Road Home and Non-Profit Data Collaboration,

the personal data will already be in existence although going forward, new program data will be collected. It is understood that most of the partners and stakeholders in the project will as a best practice, periodically check with clients about the currency of their information in terms of such things as home address and telephone numbers. Their participation in the project will be accurately recorded as it occurs. Thus, it is assumed that automatic record of program access, dialogue, or use of an app to open accessible doors will virtually be automatically be updated each time the citizen is engaged.

Thus, the privacy risk of non-compliance with the principle of Accuracy is low in both potential for serious impact and in likelihood of a non-compliance risk.

Privacy Compliance Risk – Accuracy – All projects¹⁵

	Impact – High (5)	Impact – Medium (3)	Impact – Low (1)
Probability – high (5)			
Probability – medium (3)			
Probability – low (1)			✓

g) CSA Principle # 7 – Safeguards

See Appendix D.

"Personal information shall be protected by security safeguards appropriate to the sensitivity of the information." Source – CSA Model Code

Relevant Legislation

Overall Project – RTIPPA (s. 48.1)

Digital Fredericton and Real Time Census/Dashboard –RTIPPA (s. 48.1) and S. 4.2 of Regulation 2018-24

Doorable (Appdigenous) – PIPEDA (s. 5 and subs. 4.7 of Schedule 1)

Non-Profit Collaboration – S. 50 (security), subs. 55(1) (retention), S. 56 and 56 (1.1) (PIA), and 57 (data matching) PHIPA for personal health information and ss. 46.1 and 47.1 (OIC) and S. 4.2 of Regulation 2018-24 of RTIPPA for Integrated Service Delivery

Road Home Digital Platform – S. 50 (security), subs. 55(1) (retention), S. 56 and 56 (1.1) (PIA), and 57 (data matching) PHIPA for personal health information; Federal Privacy Act for Service Canada – no specific provision

(i) **Physical Safeguards**

OIC: Section 48.1 (1) of RTIPPA specifies that:

“A public body shall establish information practices to ensure compliance with this Act and shall protect personal information by making reasonable security arrangements against unauthorized access, use, disclosure or disposal, in accordance with the regulations.”.

This means from a “Physical Safeguards” perspective that all of the projects must make “reasonable security arrangements” with respect to the personal information that the project collects, uses, discloses, and retains.

With the exception of Non-Profit Data Collaboration and Road Home Digital Platform, the Smart Cities projects information technology infrastructure is still in the conceptual stage. However, a review of documents (**see Appendix D - City of Fredericton Cybersecurity Brief**) provided by the city indicates that it has a robust information technology infrastructure platform upon which the improved technology processes of Digital Fredericton were built.

From the documents it is apparent that the City through its third-party IT vendor Bulletproof has at a minimum:

- incorporated “Privacy by Design” principles and OPC Guidance
- levels of appropriate restricted user access and authentication to access personal data
- *OIC: controlled physical access through technical and policy controls, with frequent reviews programmed into the system to determine if individuals with access are no longer associated with a project to the data storage centre, and if so that access rights are terminated; this is especially important on projects that involve several levels of personal, aggregate, or de-identified personal information*
- third-party penetration testing of the IT infrastructure for security flaws
- *OIC: system/server monitoring and reporting of attempted intrusions of the firewall and system issued alerts when there are significant attempts*
- regular updating of patches to the system where vulnerabilities are detected
- high level encryption and the use of secure socket (SSL)
- off-site back-up data storage
- audit trails
- robust passwords
- etc.

As well, Blue Spurs is the chosen third-party vendor for the selection and development of appropriate information technology for the remainder of Digital Fredericton and Dashboard. As already noted, these projects will be collecting, using, and disclosing, retaining, and keeping secure personal information from the citizens of Fredericton. While the work of Blue Spurs on the project is still in its early stages, it too has approached the project from the beginning (**See Appendix E**) with and will build the information technology platform with the same or similar features (and more) of what exists now for the city.

Regulation 2018-24 of RTIPPA requires a significant amount of controls, access limitations, monitoring, privacy breach protocol processes, compliance with and regular monitoring of an organization's security arrangements. This will be discussed in more detail under "Administrative Safeguards".

In today's world, there will always be significant privacy risks of incidents of exposure of personal information either through inadvertent errors, or with malicious hacking of systems. While relatively small in number relative to the number of overall privacy breaches of electronic records, the effects of such personal data exposures would be significant on the individuals affected. The due diligence approach of the City of Fredericton to its IT infrastructure involving personal information will significantly reduce the risk of non-compliance with the principle of 'Physical Safeguards. However, even with this, and even considering experience of the City of Fredericton and the plans for privacy and security features of the information technology information technology infrastructure, the risk of non-compliance will be at the high end of medium. This is so partly because the risk of serious impact of any breach of such a system is high because of the nature of the beast and at least medium because the systems are not fully developed.

Privacy Compliance Risk – Physical Safeguards – Digital Fredericton and Dashboard

	Impact – High (5)	Impact – Medium (3)	Impact – Low (1)
Probability – high (5)			
Probability – medium (3)	✓		
Probability – low (1)			

While Doorable has expressed its intention to incorporate industry standard privacy protection features for its information technology infrastructure platform that will service its app users, it has not articulated the specifics of those intentions in terms of privacy and security. Until this is done, the privacy risk of non-compliance with the principle of Physical Safeguards is high.

Privacy Compliance Risk – Physical Safeguards – Doorable

	Impact –High (5)	Impact-Medium (3)	Impact (Low) (1)
Probability –high (5)	✓		
Probability –medium (3)			
Probability –low (1)			

Non-Profit Data Collaboration and Road Home Digital Platform have robust security safeguards as outlined in **Appendices F and G** respectively.

For example, N.B.-IRDT uses two different servers for information and data processing. Due to the sensitive nature of the data, several measures have been applied to provide secure storage and movement of data. Software applications such as Deepfreeze, Symantec backup and Microsoft BitLocker encryption software have been employed for this purpose. There are no key components throughout the architecture that are made available through Open Source Licensing.

Closed Network

The NB-IRDT network is a closed network, meaning that all devices and activity occurring within is contained in a closed loop. There is no connectivity outside the loop, be it to the Internet (public facing network) or other local area network (LAN) segments, wide area network (WAN) segments or virtual local area network (VLAN) segments that are not already included in the loop.

Encryption

NB-IRDT service utilizes Microsoft BitLocker to fully encrypt the hard drives. The BitLocker recovery keys are backed up within active directory. Trusted Platform Module (TPM), a dedicated microcontroller (designed to secure hardware by integrating cryptographic keys into devices) have also been enabled.

Access

The entire NB-IRDT service is supported by Dell network infrastructure. This type of network is inherently secure since it is isolated from any other customer or public internet traffic making remote interference extremely difficult. Network routers have also been configured to prevent remote configuration access and forces configuration changes to be made while physically present to manage each device.

Computer System Components

Data storage and analysis services are supported by Windows 2008 and Windows 7, Dell PowerEdge series servers and Windows 7 Professional workstations.

The IT Infrastructure of the Department of Health has not yet been reviewed, but it is assumed based on the previous work in data matching based upon the approaches described that privacy impact assessments, and data sharing agreements, as well as legislative requirements have been put in place with respect to physical safeguards both at IRDT and N.B. Health. The same would be true for Service Canada's HIFIS4 System. Under these assumptions, there is still a high probability of serious impact of a privacy incident. Also, despite all of the due diligence of IRDT and N.B. Health with respect to physical safeguards, there is still a medium risk of an incident purely because of the human factor, and the rapid advances in technological capabilities to intrude into IT systems.

However, in today's cyber security world, there are inherent risks of cybersecurity incidents, and thus even with these protections in place, the privacy risk of compliance remains at the high end of medium purely because of the "nature of the beast".

Privacy Compliance Risk – Physical Safeguards – Non-Profit Data Collaboration and Road Home Digital Platform

	Impact – High (5)	Impact – Medium (3)	Impact – Low (1)
Probability – high (5)			
Probability – medium (3)	✓		
Probability – low (1)			

(ii) Administrative Safeguards

Digital Fredericton, Dashboard, and Doorable

OIC: The Privacy Management Framework and the use, implementation, and monitoring of the privacy requirements of the project and organization are extremely important. In fact, it is one of, if not THE, most important aspects of ensuring privacy considerations and obligations are part of the culture and DNA of the organization or project. The history of privacy incidents globally suggests that the risk of a non-compliance incident relative to this principle is inherently high both in terms of potential impact and likelihood of occurrence, but has been reduced somewhat with commitments from project leads, work that has been done for some of the projects, and what already exists on others

(e.g. "Non-Profit Data Collaboration"[IRDT] and "Road Home Digital Platform"[HIFIS4]). For Digital Fredericton, Dashboard, and Non-Profit Collaboration there are also, as noted earlier, specific requirements with respect to security arrangements, and to dealing with privacy breaches.

Under those regulations (2018-24), par. 4.2(3) (a) requires a "public body" under RTIPPA to have its "officers" employees and agents" (including 3rd party service providers to comply with the security arrangements that have been established. It also requires them under par 4.2(3)(b) to "periodically test and evaluate the effectiveness of the security arrangements". As well, under the same regulations subs. 4.2(4) provides for the following of certain protocols and procedures when an actual or suspected privacy breach occurs. This requires the "public body" to investigate every suspected privacy breach, maintain a registry of every actual privacy breach, and what corrective actions were taken by the public body, and notification of affected individuals where there is a "risk of significant harm". The regulation also provides guidance in determining what two of the factors to be considered in determining whether there is a "risk of significant harm".

For "Doorable", S. 5 of PIPEDA and S. 4.7 of schedule 1 requires personal information to be "protected by security safeguards appropriate to the sensitivity of the information", and the protection should be against "loss or theft, as well as unauthorized access, disclosure, copying use or modification". The specifics of the protections to be included include restricted access, locked filing cabinets, passwords, and encryption, and making employees aware of the importance of maintaining confidentiality of personal information. Recent amendments to PIPEDA through the Digital Privacy Act (S.C. 2015 c. 32) have had since November 2018 similar requirements (Division 1.1) with respect to privacy breaches that are similar to those of RTIPPA.

Essentially, the overall guidance here is that each project collecting, using, disclosing, retaining, and keeping secure personal information should establish a privacy management framework prior to becoming fully operational (i.e. beyond the testing phase). The framework should be made publicly available through the project's website and public information sessions and wordings should be reviewed to ensure that policies, procedures, and protocols are in clear and understandable language. The framework should include:

- a privacy policy for the organization and in this case the project that provides open and transparent information on how the organization collects, uses, discloses, retains, and protects personal information that it holds. It also should include the RTIPPA requirements with respect to "security arrangements" and privacy breaches. As well, it should also identify the privacy officer responsible for privacy in the organization, how individuals may gain access or correct their personal information, and how and to whom they can make complaints about non-compliance with the policy and relevant privacy legislation. This should be

made and promulgated through the project's /organization's website, making available documentation upon request, and by posting the policy in a prominent place on the organization's premises.

- *OIC: A robust governance structure that ensures that all privacy policies, procedures, and protocols are implemented, monitored, and periodically reviewed for effectiveness. This will only be done with effective leadership from the Fredericton Smart Cities Task force placing privacy as a key priority of the overall program, and providing direction to an effective privacy subcommittee of that task force that is charged with ensuring implementation by each project and periodic-follow-up.*
- a security policy that controls access to the data on a need to know basis and which is monitored for its implementation regularly
- annual audit plans and templates
- annual privacy management review policies
- privacy GAP analysis where appropriate
- *OIC: a privacy breach protocol to deal with privacy breaches of the system and breach notification requirements based on RTIPPA S. 4.2 of Regulation 2018-24("Digital Fredericton, Dashboard, and Non-Profit Collaboration) and for "Doorable" Division 1.1 of the Digital Privacy Act. As well, there is guidance from the office of the New Brunswick Integrity Commissioner with respect to actual or suspected privacy breaches that provide useful suggestions as to what should be considered in the development of such a protocol. Also, although there are no specific legislative data breach protocol requirements under the Privacy Act for "Road Home Digital Platform", (although Service Canada would probably have such protocols as a standard across the federal government), a privacy breach protocol that is consistent with any Federal policies, and RTIPPA and PIPEDA/Digital Privacy Act requirements should be developed*
- a record retention policy and reasonable record retention and destruction schedules
- a data sharing agreement template
- a data element template to test the "necessity" of any personal information being collected by an organization
- balanced and effective informed consent forms for collection of personal information

- effective governance structures that include a high-level privacy officer with access to the CEO
- a Privacy Impact Assessment Template for use to assess any new projects (or changes in projects) involving the collection, use, disclosure, retention, and security of personal information
- a Privacy Sub-Committee within that governance structure that provide meaningful and continuous oversight, monitoring and review of the privacy management program, and implementation of the organization's privacy program
- Privacy training materials, and periodic training sessions requiring participation by all staff that process personal information.
- *OIC: Third-party service agreements with the same obligations as the projects themselves and required confidentiality agreements for all third-party employees*

At the conceptual stage of Digital Fredericton, Real Time Census/Dashboard, and Doorable it is understandable that many if not most of these policies, procedures, protocols or practices do not now exist. The FSCTF and Privacy Sub-Committee has come a long way in developing some of the privacy tool kit aids for organizations noted above (e.g. draft consent guidance and draft data element template for a data "necessity test"), but still a lot remains to be done.

At this point, even with this preliminary work done, and the stated intentions to develop appropriate privacy management frameworks, the privacy risk of non-compliance with this principle remains at the high end of medium for Digital Fredericton, Dashboard, and Doorable. This will be the case until this privacy management framework is established by each project and the noted policies, procedures, protocols, governance structures, and training programs are put in place.

RPDAPS understands that the Privacy Teams of the Fredericton Smart Cities Program and Doorable are committed to ensuring that these intentions are fulfilled and in place. When they are, the risk of non-compliance with this component of the privacy principle of "Safeguards" will be substantially alleviated.

It is RDAPS understanding after discussions with NB-IRDT and a review of the HIFIS System that adequate physical and administrative safeguards are in place for those partners and the components of the relevant projects. For example, NPOs will take ID info in one file and program info in another file and place each on a separate USB device and physically take it to NB-IRDT and the New Brunswick Department of Health without disclosing the security key for the USB. Once the individual returns to his or her office, he or she will call NB-IRDT and provide the security key. Although a specific PIA or

policies at the Department of Health have not been reviewed, it would appear that its data matching of the identifying data in Non-Profit Data Collaboration to existing identifiable information de-identifying it with an institution ID and providing a linkage key would follow S. 57 of PHIPA based on previous projects the Department of Health has partnered with NB-IRDT. It is also understood that both IRDT and N.B. Health are already in compliance with SS. 47 and 47.1 of RTIPPA as well.

Non-Profit Data Collaboration's security and administrative safeguards would have been in existence since the inception of the NPOs and this assessment does not assess whatever exists there for physical and administrative safeguards. Rather it focuses on the physical and administrative safeguards of systems in IRDT and the Department of Health. While the physical and administrative safeguards of the Department Health relative to its data de-identification process have not been reviewed, it is assumed that any privacy risks associated with this process have been either mitigated or found acceptable and that legislated obligations under both PHIPA and RTIPPA have been accommodated because of the legislative requirements, particularly with respect to Data Matching. As noted above, RDAPS has reviewed NB-IRDT privacy management framework records relative to physical and admin safeguards, and is satisfied that due diligence has resulted in effective system management under this privacy principle. However, there is one significant item in this area which is not yet in place. One of the requirements of a common or integrated service delivery project is a data sharing agreement as per 46.2 of RTIPPA. *OIC: It is the author's understanding that a draft of such an agreement between the participating organizations of "Non-Profit Collaboration", IRDT, and the New Brunswick Department of Health is currently being developed for review. Forwarding such vetting, approval will be sought for signing and implementation prior to the project becoming operational. Under Section 4.1 of RTIPPA Regulations 2018-24 pursuant to par. 46.2(2)(b) of RTIPPA, this data sharing agreement must include a description of:*

- *the: integrated service delivery project,*
- *the purposes and expected outcomes of the project or activity*
- *the respective roles and responsibilities of the parties participating*
- *the personal information that is being collected, used, and disclosed during the course of the common or integrated service delivery or activity*
- *the security arrangements protecting the personal information collected, used, and disclosed through the program or activity*

The agreement also needs to contain requirements and information practices that will be in effect if any of the parties withdraws from the agreement. For "Non-Profit Collaboration" this agreement forms part of the privacy management framework and associated documents that needs to be put in place as per the section on "Administrative Safeguards"

As the project focus for Non-Profit Data Collaboration is on the data provided to the Department of Health, and IRDT whose physical and administrative safeguards appear to be on sound footing based on previous privacy assessments of systems and procedures, the privacy risks for Non-Profit Data collaboration on administrative safeguards would appear to be medium. The same would be true for Road Home Digital Platform as the User Agreement for the HIFIS4 system which Road Home will access specifies privacy requirements for users, and as well the HIFIS4 Information packages reviewed show that security and administrative safeguards for the system are in accordance with Service Canada's privacy policies. Also, it is the author's understanding that Road Home Digital Platform homeless serving agencies have signed data sharing agreements between and among themselves. Thus, the risk for Road Home would be medium as well.

OIC: As well, it perhaps goes without saying, but should be emphasized that any contracts with third party service providers (e.g. Blue Spurs) should include provisions requiring confidentiality agreements for all employees of the service providers. As well, the contract should specify that the third-party service provider should have restricted access to any project's personal information, and then only with the permission of the head of the Fredericton Smart Cities Task Force, and with the same prohibitions on further use, disclosure, and retention of personal information outside of any necessary "troubleshooting" on any project.

The risks noted above thus only apply to the City of Fredericton's projects, Appdigenous, the Non-Profit organizations that will partner with NB-IRDT and the Department of Health, and homeless serving agencies that will partner with Service Canada on HIFIS.

OIC: As there are a number of requirements that need to be met before any of the projects become fully operational, a final privacy impact assessment should be done to determine if all the stated intentions of the project leads have been implemented.

Privacy Compliance Risk – Administrative Safeguards – Digital Fredericton, Real Time Census/Dashboard and Doorable

	Impact – High (5)	Impact – Medium (3)	Impact – Low (1)
Probability – high (5)			
Probability – medium (3)	✓		
Probability – low (1)			

Privacy Compliance Risk – Administrative Safeguards – Non-Profit Collaboration and Road Home Digital Platform

	Impact – High (5)	Impact – Medium (3)	Impact – Low (1)
Probability – high (5)			

Probability – medium (3)	✓		
Probability – low (1)			

h) CSA Principle # 8 – Openness

"An organization shall make readily available to individuals specific information about its policies and practices relating to the management of personal information." Source: CSA Model Code.

Relevant Legislation

Overall Project – RTIPPA

Digital Fredericton and Real Time Census/Dashboard –RTIPPA (S. 48.1)

Doorable (Appdigenous) – PIPEDA (s. 5 and subs. 4.8)

Non -Profit Collaboration - PHIPA (par. 49(1) (d)) s. 50) re personal health information; RTIPPA (s. 48.1) for Integrated Service Delivery,

Road Home Digital Platform – PHIPA (par. 49(1) (d)) s. 50) re: personal health information
Federal Privacy Act (ss. 71 and 72) for Service Canada's HIFIS4 System

All Projects

The City of Fredericton has been open, transparent and accountable about its Fredericton Smart Cities proposal, the projects within its proposal, the goals and objectives of the proposal, and the predicted outcomes. It has also had public engagement through social media, online surveys, focus groups and website updates about the proposal. However, none of the public announcements, presentations, or Smart Cities website material has discussed the privacy protection that the project will provide. These activities are essential for the overall goals of the Smart Cities Program including citizen engagement, dialogue, and consultation.

In short, none of the projects appear to have provided any public statements, on- line postings, or public forums on the privacy policies of Fredericton Smart Cities and its individual projects. However, it is still early stages, and the FSC Privacy Team is committed to providing this information about the privacy protection that will be in place for FSC prior to it becoming fully operational. Because of the openness evidenced by the overall project to date, there is no reason to doubt this commitment, and on that assumption the privacy principle of non-compliance at this point would be medium

NB-IRDT and the New Brunswick Department of Health which are partners in the Non-Profit Data Collaboration Project have open and available statements or FAQ's about their privacy policies generally and with respect to the partnership activities they participate in. The same is

true for Service Canada as the host of HIFIS for the Road Home Digital Platform. There is also a commitment by the Privacy Team and the project leads to continue the open and transparent flow of information that has existed to date with respect to the public promulgation of privacy policies, identification of persons responsible for privacy on each project on a website, and open forums. Under the assumption of the actual fulfillment of this commitment prior to each project becoming operational, the privacy risk is lowered to medium in terms of potential

Privacy Compliance Risk – Openness – All projects¹⁶

	Impact – High (5)	Impact-Medium (3)	Impact (Low) (1)
Probability – high (5)			
Probability – medium (3)		✓	
Probability – low (1)			

i) CSA Principle # 9 – Individual Access

“Upon request, an individual shall be informed of the existence, use, and disclosure of his or her personal information and shall be given access to that information. An individual shall be able to challenge the accuracy and completeness of the information and have it amended as appropriate.” – Source: CSA Model Code

Relevant Legislation

Overall Project – RTIPPA

Digital Fredericton and Real Time Census/Dashboard –RTIPPA – Sections 7-16 and S.40

Doorable (Appdigenous) – PIPEDA (ss. 5, 8, 9 and principle 4.9)

Road Home Digital Platform – ss. 7-14 PHIPA for personal health information; Federal Privacy Act (S. 12) for Service Canada’s HIFIS4 System.

Non -Profit Collaboration - RTIPPA for Integrated Service Delivery (where applicable), and PHIPA (ss. 7-16) re health identifiers

City of Fredericton, Digital Fredericton, Real Time Census Data and all other projects

Apart from the City of Fredericton, there does not currently appear to be publicly available policies, procedures, and protocols whereby individuals are informed as to how they may obtain access to, and/or correction of their own information collected by any of the Smart Cities projects. The City of Fredericton has a public Right to Information and Protection of Privacy

website <http://www.fredericton.ca/en/right-to-information-and-protection-of-privacy> , that provides information on how to request information from the city under RTIPPA, but it does not specify any entitlement of citizens to obtain their own personal information. It also provides instructions on how to make a request to correct your own personal information, but again no reference on how to obtain your own personal information or launch a privacy complaint. Thus, for the overall project, and Digital Fredericton and Dashboard, this website needs to be tweaked with appropriate information to provide clearer instructions on how to obtain your own personal information. Since the process of how to request information under RTIPPA is on the website, the privacy risk of non-compliance with this principle is medium in both seriousness of impact and likelihood of a non-compliance incident. Once the tweaking of the website is done and policies, procedures, and/or protocols are publicly available, the risk would be substantially minimized.

While two of the remaining projects under Fredericton Smart Cities (Non-Profit Data Collaboration, and Road Home – Digital Platform) may have practices in place to provide individuals with access to their own program files, there is no publicly available policy that informs individuals of that right. The Non-Profit Organizations providing service delivery to citizens and the homeless serving agencies of Road Home can mitigate this privacy risk of non-compliance with this principle, by merely developing policies, procedures, or protocols and promulgating them to their clients. Until this is done, the privacy risk of non-compliance with this principle would be high both in potential seriousness of impact and likelihood of a non-compliance event.

While NB-IRDT and the New Brunswick Department of Health would have de-identified personal information from the Non-Profit Organizations, this principle is not applicable to them as individuals would go to the source of identifiable personal information held on them. The same would be true of Service Canada, since although any personal information from Road Home homeless serving agencies would be on HIFIS, which is in the custody of Service Canada. The source of the information would be in the homeless serving agency to which the Individual would be directed to access their own information. Should the individual however make an application to Service Canada for their personal information in the program files of the homeless serving agencies, Service Canada's established policies for responding to such requests under the Federal Privacy Act would be in play, and Service Canada would likely consult with the homeless serving agency on any decision on disclosure. This would only occur however where the individual did not agree to seek their personal information from the homeless serving agency.

Doorable (Appdigenous) is in a similar situation to Non-Profit Data Collaboration and Road Home, and does not have such policies, procedures, or protocols that provide information on how individuals may gain access to their own files since the project is not yet close to being operational. Thus, until these are developed the privacy risk of non-compliance with this principle would be high as well.

Privacy Compliance Risk – Access - City of Fredericton, Digital Fredericton, and Dashboard¹⁷

	Impact – High (5)	Impact – Medium (3)	Impact – Low (1)
Probability –high (5)			
Probability – medium (3)		✓	
Probability –low (1)			

Privacy Compliance Risk – Access – Non-Profit Data Collaboration, Road Home Digital Platform, and Appdigenous¹⁸and Doorable

	Impact – High (5)	Impact – Medium (3)	Impact – Low (1)
Probability – high (5)	✓		
Probability – medium (3)			
Probability – low (1)			

j) CSA Principle # 10 – Challenging Compliance All Projects

“An individual shall be able to address a challenge concerning compliance with the above principles to the designated individual or individuals accountable for the organization’s compliance.” – Source: CSA Model Code

Relevant Legislation

Overall Project – RTIPPA (par. 14(1) (c) (c) (iv) and par. 48.1(4) (d)

Digital Fredericton and Real Time Census/Dashboard –RTIPPA (par 14(1) (c) (iv)

Doorable (Appdigenous) – PIPEDA (S. 5 and principle 4.10)

Non -Profit Collaboration – subs 65(2) and S. 65 –subs. 75(3), particularly S. 68 for personal health information; RTIPPA (subpar. 14(1)((c) for Integrated Service Delivery

Road Home Digital Platform – subs 65(2) and S. 65 –subs. 75(3), particularly S. 68 for personal health information Privacy Act (subs. 16(1) and S. 29) for Service Canada’s HIFIS4 System

¹⁷ The exceptions as noted are NB-IRDT, New Brunswick Department of Health, and Service Canada

¹⁸ The exceptions as noted are NB-IRDT, New Brunswick Department of Health, and Service Canada

As far as can be determined, none of the projects have developed a policy, protocol, or procedure for individuals to complain about the organization's privacy compliance with the ten CSA principles or relevant legislation. However, in Non-Profit Data Collaboration NB-IRDT has a privacy compliance complaint mechanism noted at <https://www.unb.ca/fredericton/arts/nbirdt/privacy-policies.html>. As well the Department of Health and Service Canada have provisions in their legislation to allow for complaints to be made to its privacy officer, and the N.B. Integrity Commissioner and Privacy Commissioner of Canada respectively. Thus, the privacy compliance risk here rests entirely with the individual projects. *OIC: Each project needs to publicly provide a publicly available complaint procedure on their website and in publicly available notices, or prominently available policy documents or notices in their offices. The policy or notice should be easily readable and understandable in laying out how any privacy complaints may be initially commenced by complaining to the project's privacy officer, with an option to complain to the Integrity Commissioner of New Brunswick who fulfills the functions of privacy oversight for the Province.* Until such complaint process is identified in a policy document and a "frequently asked questions" document for each of the projects and the Fredericton Smart Cities process overall the privacy compliance risk for this principle is high in terms of potential serious impact, and in likelihood of a non-compliance incident. The Privacy Team for Fredericton Smart Cities is committed to removing this deficiency once projects are operational. Once this is done the risk here will be substantially alleviated.

Privacy Compliance Risk – Challenging Compliance – All projects¹⁹

	Impact – High (5)	Impact-Medium (3)	Impact (Low) (1)
Probability – high (5)	✓		
Probability – medium (3)			
Probability – low (1)			

9. Privacy Considerations – Partnership with St. Mary's First Nation

In April 2018, the City of Fredericton and St. Mary's First Nation (SMFN) partnered on the Fredericton Smart Cities Challenge program and are participating in the program's projects according to the service priorities and needs of its leadership and members. SMFN will have a role in the governance of the project through its membership on both the Fredericton Smart Cities Task Force and the Task Force's Privacy Sub-Committee. SMFN will be consulted on a regular basis with respect to its intentions and choices of participation in any of the FSC projects. While it is fully committed to the philosophy and design of the FSC project, and has been kept informed of the progress in moving the FSC program's projects forward, community

¹⁹ The exceptions as noted are NB-IRDT, New Brunswick Department of Health, and Service Canada

leadership of St. Mary's First Nation at this point has not decided on which projects will be priorities in addressing its service needs as a community.

The privacy principles that will govern its participation will be the same ten principles that have been the subject of the privacy assessments in the previous pages. However, St. Mary's First Nation as a first nation is not subject to any provincial or federal privacy legislation as it is not a provincial "public body" as defined by RTIPPA and because of its status as a federal entity. It is not subject to the Federal Privacy Act because it is not a federal "government institution", and it is not subject to PIPEDA except when it collects personal information in the course of "commercial activity". However, St. Mary's First Nation is aware and respectful of the ten CSA principles and the need for the application of the principles to its participation on any of the projects. Its plans for participation in any of the projects, and the privacy principles that will be part and parcel of its participation, will be reviewed prior to the development and preparation of the Final Privacy Impact Assessment (FPIA).

At the same time, the FSC Task Force is mindful and respectful of the First Nations Privacy concept of community privacy developed by the First Nations Information Governance Centre in the wake of the unpleasant experiences of some first nations with respect to health research projects. The FSC Task Force and projects are aware of and respect the fundamental principles described by OCAP®; that acknowledge that the rights of First Nations communities to own, control, access, and possess information about their peoples is fundamentally tied to self-determination and to the preservation and development of their culture.

St. Mary's First Nation will thus be consulted on any disclosure of aggregate/ de-identified information about its community, and St. Mary's will have the authority to veto any public disclosure of such aggregate information. The FSC Task Force is also committed to following the CSA's ten privacy principles in any collection, use, or disclosure of personal information related to the participation of individual St. Mary's First Nations members on any FSC projects. It is also committed to ensure that the FSC Task Force will never disclose personal information of any member of the St. Mary's First Nation without the informed consent of the individual.

It is further committed to consulting with the St. Mary's First Nation and providing them with a veto with respect to any public disclosure of aggregate information about its community aggregate information.

10. Review of the Project's Consideration of the Seven Privacy by Design Principles, OPC/IPC Guidance and the Project's Privacy Principles

a) Privacy by Design²⁰

(i) “Proactive not reactive: preventative not remedial”

RPDAPS has engaged with the Fredericton Smart Cities Privacy Project Team in late 2018, and at his prompting, the team has committed to building privacy protections from the “get-go” into the project. As the overall projects, and each of its five pilot projects, are still in the conceptual stage, this involved ensuring that the ten CSA fair information principles were placed as signposts from the initiation of the privacy discussion on the project. With one exception this involved, where possible, ensuring that all personal information collection involving new data sets was based on thorough informed consent from individuals. The only exception would be where a project was dealing with existing data and further use and disclosure was consistent with the purpose of the original collection. It involved agreeing to the development of a “data collection template” that will require for each personal data element to be collected a statement of why it is necessary. It involved the agreement that a personal information informed consent template would be developed. It was agreed that it would be thorough and but balanced to the degree that a reasonable person would understand the purposes of collection, the specific further uses of the information, to whom or what organization, if any, would the information be disclosed in identifiable or aggregate or de-identified form. It also involved an agreement that the use of the consent form and the data which would be collected under, as well as its administration, would be reviewed annually by the Privacy Sub-Committee to ensure compliance with the CSA principle of Consent.

Finally, while the information technology infrastructure in the form of IT platforms, data bases, aggregation/de-identification software, and security is still in its early stages, that industry best privacy and security practices would be embedded. As well, it was agreed that a Threat Risk Assessment would be done prior to commencement of usage of the infrastructure.

The project privacy team for the Fredericton Smart Cities Task Force was fully engaged from the beginning in the development of these privacy tenets for the project, and continues to be so involved.

(ii) Privacy as the default setting

As noted above, the entire project has been fully based on the idea that privacy considerations are to be front and center from the beginning as the personal information to be collected, used, and disclosed will be extensive and complex because of the several privacy laws involved.

²⁰ The author is grateful to Dr. Ann Cavoukian and Ryerson University for developing these principles as guidance with respect to any privacy impact assessment.

(iii) Privacy embedded into design

For Digital Fredericton, Real Time Census/Dashboard the developer has committed from the beginning to build the information technology infrastructure based on the highest industry best privacy and security practices. For Non-Profit Collaboration and Road Home Digital Platform, the personal information involved will be fed into systems that were developed with privacy principles at the forefront.

(iv) Full functionality: positive-sum, not zero sum

The Fredericton Smart Cities Privacy Team is of the belief expressed in its commitment and cooperation in building the privacy structure under which the overall project and each pilot project function that the Fredericton Smart Cities Project can "have it all". That is to say that not only will it be effective and defining and responding to service needs of Fredericton's citizens, but it will have the privacy protection of its citizens whose data will be collected at the forefront of all projects.

(v) End-to-end security: full lifecycle protection

While there has been some preliminary personal information collection in the form of ethnographic research to identify population segments already done, and stored on a secure cloud-based platform, the majority of personal information is yet to be collected. The exceptions to this are existing personal information program files of non-profit service delivery organizations (e.g. Meals on Wheels) or homeless serving agencies (e.g. shelters). These files already exist and will be securely transferred to the New Brunswick Department of Health and NB-IRDT and de-identified to allow for research to be conducted, or to Service Canada's Homeless Family Information System (HIFIS) a Government of Canada secure data platform. These organizations were ahead of the game and had already established privacy and security life-cycle systems to protect the privacy of citizens.

(vi) Visibility and transparency: keep it open

The privacy team of the FSCTF has agreed that the citizens of Fredericton should know and understand how their privacy will be protected through a series of open forums once Infrastructure Canada Selection of successful bidders is completed. As well, the privacy framework under which the Fredericton Smart Cities Project and its pilot projects will operate will be posted on what will become a Fredericton Smart Cities Website.

As well, through the Dashboard Project's Smart Cities online data portal, citizens will be informed of progress on implementation of the Smart Cities Program.

(vii) Respect for user privacy: keep it user centric

The entire structure of the Fredericton Smart Cities Program will be focused on respecting the privacy of individuals who participate in the program and its projects. It is understood that in pursuing this goal that the privacy mitigation strategies recommended in this Preliminary PIA will wherever possible be implemented. This will mean that regardless of the privacy legislation (or no legislation at all) that the Smart Cities Program partners fall under that there will be compliance with the ten CSA Privacy Principles. This means that:

- IT Infrastructure will attempt to have all of the appropriate privacy and security technology and best practices in place from the “get-go”
- All organizations will have a complete privacy framework and associated policies, procedures, and protocols in place prior to commencement
- Meaningful informed consent will be the default setting on any project where personal information will be collected in the future.
- Appropriate avenues will be provided to access one’s own information or complain about privacy practices in individual projects.

b) OPC/IPC Guidance

(i) Data minimization

To ensure that only information that is necessary to achieve the outcome of the initiative will be done, all projects will have to complete a data element template explaining why each piece of data is necessary for the project.

(ii) De-identification

With the exception of the Road Home Project, and possibly Doorable all data collected by each project will be de-identified or aggregated prior to any disclosure outside the project. The Road Home project will feed program user personal information into the Service Canada HIFIS data platform, and while it will be aggregated for performance measurement purposes, it will permit homeless serving agencies (e.g. shelters) to share information through the system under strictly controlled data sharing agreements. At the moment this is not possible except through one-on-one exchanges. Doorable may with the informed consent of its user base at some later point provide individual data to the City of Fredericton to improve their experiences with accessibility issues. However, initially Doorable users’ personal data provided to Doorable will only be shared in aggregate form with the City of Fredericton. All other data from the three other projects will only be shared with partners on an aggregated basis according to Statistics Canada guidelines.

(iii) Data governance and privacy management program

As this Preliminary PIA will show, planned data governance for the overall project, and its five pilot projects, is not yet in place. Data governance systems will be developed once the FSC proposal is approved by Infrastructure Canada. As this PIA will show as well, there are a variety of privacy management programs, or none at all, in place at the moment. Once the proposal is approved, the recommended mitigation strategy is to put a consistent privacy management program in place for each project. Some projects (e.g. "Road Home" and Non-Profit Data Collaboration) have such programs in place now, and will only need to be reviewed for consistency with the overall program

(iv) Privacy impact assessments and threat risk assessments

This preliminary privacy impact assessment has been completed. It is the intention of the FSCTF that a threat risk assessment would be done on all proposed Information Technology Infrastructure at the stage that the conceptual technical architecture has been defined.

(v) Community engagement and project transparency

The City of Fredericton Community has already been engaged through a series of open forums and ethnographic research. These will continue once the project is approved and periodic updates on the progress of project implementation, and aggregate data from the projects will be posted on the Dashboard open government online portal.

(vi) Consent

Except where there are existing personal information data sets (e.g. Road Home and Non-Profit Data Collaboration), all personal information will be collected only through the use of consent that is informed and thorough in its identification of purpose, uses, disclosure, record retention, and security. It will also provide for a prominent opt-out option and will be reviewed annually as well in terms of its use. This will be especially important in a consent form to be used as part of the e-government experience component of the Digital Fredericton Project.

OIC: The first draft of the Fredericton Smart Cities Proposal Preliminary Privacy Impact Assessment was also submitted to the Office of the New Brunswick Integrity Commissioner (OIC). The commissioner is responsible for oversight of the New Brunswick Right to Information and Protection of Privacy Act (RTIPPA) and the Personal Health Information Protection and Access (PHIPA) Act. Comments on the first draft were provided by the Legal Counsel from that office and FSC wishes to thank the Integrity Commissioner Office for their legal counsel for the helpful analysis and

comments with respect to clarifying and strengthening points in the PPIA. A full summary of the responses to the comments of the (OIC) is contained in In Appendix H. The summary corresponds to the points made by the OIC and indicates the edits and page references where edits were made to more fully elaborate or clarify points addressed in the PPIA.

c) Fredericton Smart Cities Task Force Privacy Principles

From its inception, the Fredericton Smart Cities Project has set as a signpost its own principles under which it will develop a privacy management framework for the project. These are exemplified in the work done in developing the project proposal in the following way.

1) Respect

The Privacy Team of the FSCTF has from its inception in viewing the legislated privacy obligations and the ten CSA privacy principles approached the needs of the project with the philosophy of consideration for the privacy of each and every citizen who will participate in the FSC's five projects. The thorough due diligence, even at the early conceptual stage, that the task force privacy team, has approached the requirements under each CSA Privacy principle as well as its full participation in the PIA process is ample evidence of this. The respect for the privacy rights of its citizens is concomitant with its approach to the service delivery needs of its citizens.

2) Anonymization

Each project is self-contained in its approach to the collection, use, and disclosure of personal information. Other than to provide individual services and obtain feedback within the project, all personal data will be either de-identified or aggregated in terms of further use and disclosure outside the project.

3) Control

Each individual citizen of the city will control the further use and disclosure of their personal information by having the opportunity to be informed about intended further uses and disclosures in a thorough informed consent form. Aggregate information that is needed for informing the citizenry of trends, and suggesting opportunities for improved service delivery will be publicly available for use and analysis by citizens and citizen groups.

4) "Necessity"

Only necessary personal information that is needed for the effective delivery of each of the projects selected. This will be determined in the case Non-Profit Data Collaboration and Road Home Digital Platform on the basis of existing data requirements for both projects. For all other projects, there will be a requirement to complete a data element

template for each data element collected and explain why it will be necessary for the success of the project

5) Consent

With two exceptions, meaningful informed consent will be used prior to the collection of any personal information. Road Home and Non-Profit Data Collaboration will not use consent for existing data as the further use and disclosure will be a consistent use. But once those projects are operational, all future data collections will require consent for any new personal information collected on those projects.

6) Community Ownership

Fredericton and St. Mary's First Nation Communities are the owners of all aggregate information on each project. They will be consulted on any further uses and disclosures proposed for each project.

7) Consultation

Consultation with the citizens of Fredericton on the progress of the overall project and uses of information obtained through the projects will occur on a regular basis.

8) Access

Each individual citizen and indigenous member of St. Mary's First Nation will have the right to obtain their own information collected on each project.

9) Transparency, Accountability, and Open Government

FSCTF is committed to providing information showing the functionality of each project, the results of information gathered, and future service delivery options or plans. It will openly identify the individuals and titles of all those project leads who would be responsible for each project. Finally, it is committed to providing useful and helpful information in aggregate form about the identity of the city as a community, what its service needs are, and how they will be met.

10) Security

FSCTF is committed to ensuring that the privacy and security of its citizens is protected with respect to any personal information that they provide through the implementation of appropriate current privacy and security standards for information technology infrastructure and by effective administrative safeguards consistent with best privacy practices.

11. Conclusions

a) General Assessment

A general preliminary privacy impact assessment of privacy risks associated with the 10 CSA privacy principles, the *N.S. FOIPOP Act*, and the *Personal Information International Disclosure Protection Act (PIIDPA)* are, based on current information medium in the short term, and, mostly low in the long term once recommended mitigation strategies are implemented. In the area of administrative safeguards these include, a privacy management framework consisting of privacy, security, retention policies, a consent form with further use and disclosure limits, a data collection "necessity test" template, a privacy breach protocol and policies with respect to individual access, and challenging compliance.

b) Strategy for Mitigation of Privacy Risks

The majority of serious risks would be mitigated by each project developing and implementing a privacy management framework, including such documents as a robust informed consent form, and a "necessity" based data element collection form, etc., etc..

c) Additional Comments

This Final PIA was prepared using a review of documents and a series of interviews with project leads, and discussions and meetings with FSCTF Privacy Sub-Committee. It is also predicated on certain assumptions that certain tasks will be completed prior to projects becoming fully operational. As well It relied on information supplied by the project's director and chair of the Task Force. The author has to the best of his ability attempted to confirm all of this additional information, but is not responsible for any errors or omissions in this additional information or assumptions, or on any conclusions which are based upon them.

PIA Type	Date	Comments
Preliminary	01/24/2019	Input and review provided by all project leads
Final		

Completed by:

Robert P. Doherty – Access and Privacy Services

Date:

Reviewed by: Project Manager, Fredericton Smart Cities

Date:

Recommended by: Fredericton Smart Cities Privacy Sub-Committee

Date:

Approved by: Executive Chair Fredericton Smart Cities Task Force

Date:

Appendix A: Consent Form Guidance

CONFIDENTIAL

Fredericton Smart Cities Program – Consent Form Guide

The _____ project of the Fredericton Smart Cities Program pursuant to [OIC: S. 37 of the New Brunswick Right to Information and Protection of Privacy Act (RTIPPA), Section 4 of Personal Information and Electronic Documents Act (PIPEDA), or SS. 4-5 of the Privacy Act] will only collect your personal information as part of this project in accordance with SS. 43-46.1 of that legislation] and the purposes, uses, disclosures, record retention described here. By consenting to the statements provided below, you hereby agree to participate in this project in accordance with the terms and conditions described below.

OIC: I consent for _____ to collect my personal information including _____ **(specify and use check boxes where necessary)** for the purpose of _____. I understand that my personal information can be used solely for the purposes of _____

(Be specific with the specification of uses) except as authorized or required by law.

I also understand that personal information will not be sold or distributed to any third parties. For other disclosures my information will be aggregated / anonymized and used to create data sets for analysis to improve delivery of programs or services and enable economic opportunities.

I further understand that my personal information will be protected and kept secure. It will be stored in a safe location within appropriate information technology infrastructure.

It will be retained in accordance with federal, provincial, municipal or university retention and destruction schedules and policies.

OIC: I understand that I can revoke my consent at any time and that my personal information will be deleted at my request. As well, the above terms and conditions will be reviewed annually by _____, and you will be notified of any changes and provided with the option to opt out of participation in the program.

If you have any questions about the collection, use, or disclosure of your personal information, you may contact:

Name:

Position and Organization:

Business Address

Phone Number:

Email Address:

Name of Project _____

[illegible]

New Brunswick Right to Information and Protection of Privacy Act

S. 1 - Definitions

"personal information" means recorded information about an identifiable individual, including but not limited to

- (a) the individual's name,
- (b) the individual's home address or electronic mail address or home telephone or facsimile number,
- (c) information about the individual's age, gender, sexual orientation, marital status or family status,
- (d) information about the individual's ancestry, race, colour, nationality or national or ethnic origin,
- (e) information about the individual's religion or creed or religious belief, association or activity,
- (f) personal health information about the individual,
- (g) the individual's blood type, fingerprints or other hereditary characteristics,
- (h) information about the individual's political belief, association or activity,
- (i) information about the individual's education, employment or occupation or educational, employment or occupational history,
- (j) information about the individual's source of income or financial circumstances, activities or history,
- (k) information about the individual's criminal history, including regulatory offences,
- (l) the individual's own personal views or opinions, except if they are about another person,
- (m) the views or opinions expressed about the individual by another person, and
- (n) an identifying number, symbol or other particular assigned to the individual.

Appendix C: Preliminary Privacy Impact Assessment Fredericton Smart Cities Proposal Assessment Score Sheet

P= probability of a privacy non-compliance incident

I= Potential Serious Privacy Impact

1 point = minimum

3 points = medium

5 points = high

P x I = Privacy Risk Assessment Score

Maximum Privacy Risk Score = 25 points

Minimum Privacy Risk Score = 1 point

OIC italic

CSA Privacy Principle	Digital Fredericton	Real-Time Census/ Dashboard	"Doorable" (Appdigenous)	Non-Profit Data Collaboration	Road Home Digital Platform	Recommended Mitigation Strategy
1. Accountability	P=1 I= 1 Score = 1	P=1 I= 3 Score = 3	P=1 I= 3 Score = 3	P=1 I= 3 Score = 3	P=1 I= 3 Score = 3	Put in place an overall governance structure for FSC and formally/publicly identify individual/position responsible for privacy on each project <i>and identify that individual on the project's website</i>
2. Identifying Purpose	City HR info	Personal Needs/Interactive	P= 3 I=3	P= 3 I=1	P= 3 I=1	Develop and use a consent form that clearly identifies the specific

	P= 1 I= 1 Score -1 E-Govt P=3 I=3 Score -9	P= 3 I=3 Score 9	Score 9	Score 3	Score 1	purpose(s) for the collection, use and disclosure of personal information and <i>allows the individual to opt out and also have their personal information deleted at their request; ID person responsible to answer questions and deal with complaints</i>
3.Consent	P=3 I=3 Score -3	P=3 I=3 Score -3	P=3 I=3 Score -3	P= 1 I=1 Score - 1	P= 1 I=1 Score - 1	Develop and use a consent form that clearly identifies the specific purpose(s) for the collection, use and disclosure of personal information, as well as the length of time it will be retained and what security there will be around it; <i>provide a clear statement that allows the individual to opt out and also have their personal information deleted at their request; ID person to contact with questions or complaints; review this annually by an independent 3rd party; for NPO and Road Home develop/use a specific informed consent form for future collections of personal information by clients a</i>
4. Limiting Collection	P=3 I= 3 Score -3	P=3 I= 3 Score -9	P=3 I=3 Score -3	P= 1 I=1	P= 1 I=1	<i>Prior to the initiation of any project Modify and use a data element collection template that requires explanation of why each data element is necessary for Digital Fredericton,</i>

						<p>Dashboard and "Doorable"; review by a third party annually. While existing data sets will form the basis of the deidentified information for research and statistical analysis for "Non-Profit Collaboration" and "Road Home Digital Platform", and for current interactions with Road Home clients, it is recommended that on a go forward basis that each data element be reviewed for future collections on the same basis as other projects; also it is recommended that each Non-Profit organization be required to post a notice in their office area, or to inform clients during interactions that they may opt out of having their personal information collected.</p>
5. Limiting Use, Disclosure and Retention	Limiting Use and Disclosure P=3 I=3 Score 9 Retention P=1 I=1	Limiting Use and Disclosure P=3 I= 3 Score - Score -3 Retention P=1 I=1 Score -1	Limiting Use and Disclosure P=3 I= 3 Score -3 Retention P=3 I=3	Limiting Use and Disclosure P=3 I=3 Score -9 Retention P=1 I=1	Limiting Use and Disclosure P=3 I= 3 Score -9 Retention P=1 I=1 Score -1	Limiting Use and Disclosure Develop and use a thorough informed consent form for clients interacting with the project that specifically limits further use and disclosure other than for the identified purposes of collection "except as authorized or required by law"; third party monitoring on an annual basis; monitor

	Score -3		Score -9	Score -1		implementation of consent requirements Retention Put the resources in place and develop an overall records retention policy for the FSC Program that is consistent with the Municipal Records Authority <i>and any revisions to that under the Provincial Archives Act</i>
6.Accuracy	P= 1 I= 1 Score -1	P= 1 I= 1 Score -1	P= 1 I= 1 Score -1	P= 1 I= 1 Score -1	P= 1 I= 1 Score -1	Ensure that from a policy/protocol perspective that project staff are reminded to verify and update client information
7. Safeguards	Physical Safeguards P=5 I=3 Score = 15 Admin Safeguards P= 5 I=3 Score = 15	Physical Safeguards P=5 I=5 Score=3 Admin Safeguards P= 5 I=3 Score = 15	Physical Safeguards P=5 I=5 Score = 25 Admin Safeguards P= 5 I=5 Score = 25	Physical Safeguards P= 3 I= 5 Score =15 Admin Safeguards P= 5 I=3 Score = 15	Physical Safeguards P= 3 I= 5 Score =15 Admin Safeguards P= 5 I=5 Score = 15	<i>Follow Privacy by Design Principles and establish privacy and security infrastructure that incorporates what privacy and security features are required to ensure that personal information is protected relative to its sensitivity and vulnerability; establish a privacy management framework (privacy policy, privacy governance structure, breach protocol, retention policy etc. for records, training materials etc.) and implement same and monitor adherence to the framework; Essentially, the overall administrative safeguard</i>

						guidance here is that each project collecting, using, disclosing, retaining, and keeping secure personal information should establish a privacy management framework prior to becoming fully operational (i.e. beyond the testing phase). The framework should be made publicly available through the project's website and public information sessions and wordings should be reviewed to ensure that policies, procedures, and protocols are in clear and understandable language. :
8.Openness	P= 3 I=3 Score=9	P= 3 I=3 Score=9	P= 3 I=3 Score=9	P= 3 I=3 Score=9	P= 3 I=3 Score=9	Continue the openness and transparency philosophy of FSC by ensuring that privacy features of the program are promulgated successfully through websites and open forums <i>at the point of going fully operational</i>
9. Individual Access	P=3 I=3 Score=9	P=3 I=3 Score=9	P=5 I=5 Score=25	P=5 I=5 Score = 25	P=5 I=5 Score = 25	Establish and promulgate procedures on websites and other communication venues whereby individual citizens are informed of how they may obtain their own personal information that the organization holds on them and <i>how they may make a request to correct any errors in their personal information</i>

10. Challenging Compliance	P=5 I=5 Score = 5	P=5 I=5 Score =5	P=5 I=5 Score = 25	P=5 I=5 Score = 25	P=5 I=5 Score = 25	Publish openly how and to whom individuals may complain about their privacy rights being compromised. Essentially each project needs to publicly provide a publicly available complaint procedure on their website and in publicly available notices, or prominently available policy documents or notices in their offices. The policy or notice should be easily readable and understandable in laying out how any privacy complaints may be initially commenced by complaining to the project's privacy officer, with an option to complain to the Integrity Commissioner of New Brunswick who fulfills the functions of privacy oversight for the Province.
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Appendix D: Brief on City of Fredericton Cybersecurity Approach

Cybersecurity Charter

The City of Fredericton has developed a Cybersecurity Charter based on an evaluation of the City's maturity against the NIST SP800-3 framework. The charter outlines a security framework, goals, and principles along with roles and responsibilities within the organization for cybersecurity, the resources available, and a five-year roadmap of initiatives that move the City along the maturity framework.

The City of Fredericton has entered into a Letter of Intent with UNB Canadian Institute for Cybersecurity, IBM, and Bulletproof Solutions to collaborate on cybersecurity research, product and workforce development, and network protection.

The City of Fredericton is engaged with Bulletproof Solutions and Beauceron Security for the implementation of cybersecurity protection measures including, awareness, monitoring, incident response, and expert oversight.

Bulletproof Security Operations Centre (SOC)

1. The City of Fredericton's information networks and cloud software services and data platforms will be connected to the Bulletproof SOC for Incident monitoring. The SOC utilizes the IBM QRadar SIEM (Security Incident and Event Monitoring) product, as well as the IBM Security X-Force Threat Intelligence service, and provides 24x7x365 QRadar-based monitoring, with the generation of alerts when security events are detected.
2. Quarterly penetration testing is provided by senior security operations personnel and involves authorized "attacks" on all or parts of the City's network and systems with the explicit intent to gain unauthorized access by exploiting vulnerabilities.
3. SOC personal will routinely engage in threat hunting on the City's systems and perform enterprise threat detection and employ red team vs. blue team and honeypot approaches.
4. The SOC provides incident response and breach protocol management, which involves the creation, classification, prioritization, triage, and escalation of incidents for subsequent threat elimination or containment.
 - Incident Management
 - Incident Classification and Initial Support
 - Level 1, 2, 3 Incident Triage
 - Vendor Level 4 Incident Triage
 - After-Hours Escalation Support
 - Emergency Remediation Support

5. Service Level Review and Reporting Process involve the monthly review of service level metrics, incidents, change requests, and service requests, as well as the regular and ad hoc production of security reports.
6. Security policy and rule management process involves the ongoing maintenance of security event monitoring policies and rules.

Virtual Chief Information Security Officer (CISO)

Virtual CISO involves a senior member of the Bulletproof SOC team meeting with the City of Fredericton two ½ days per month and acting as a member of the City's cybersecurity management team for duties relating to:

- security management,
- incident response planning and breach protocols
- policy development,
- risk assessment, and
- oversight and selection of the Cybersecurity Charter initiative.

Cybersecurity Training

The City has engaged with Beauceron Security to provide cybersecurity awareness and compliance training, which involves automated, simulated phishing attacks sent to the customer to enhance security awareness and compliance;

- User awareness training
- Simulated Phishing
- Cybersecurity score for City employees

Cloud Security

The City of Fredericton Smart Cities proposal uses a multi-cloud approach with cloud software and infrastructure from multiple vendors including Oracle, Amazon Web Services (AWS), and ESRI among others. Smart Cities data and applications will be hosted, secured and made available on these cloud platforms and services.

ISO and NIST Standards Compliance

The cloud service providers engaged comply with ISO/IEC 27001:2013, and/or the National Institute of Standards and Technology (NIST) Special Publication 800-53 (Revision 4) which maps to International Standards Organization (ISO) 27001.

These security management standards specified security management best practices and comprehensive security controls following the ISO/IEC 27002 and NIST best practice guidance. The basis of this certification is the development and implementation of a rigorous security program, which includes the development and implementation of an Information Security Management System (ISMS) which defines how providers perpetually manages security in a holistic, comprehensive manner. This widely-recognized international security standard specifies that providers do the following:

- Systematically evaluate our information security risks, taking into account the impact of threats and vulnerabilities.
- Design and implement a comprehensive suite of information security controls and other forms of risk management to address customer and architecture security risks.
- Have an overarching management process to ensure that the information security controls meet customer needs on an ongoing basis.

Service Organization Control Reports (SOC1, SOC2)

A Service Organization Control 1, or SOC 1 engagement, is an audit of the internal controls at a service organization which have been implemented to protect client data. SOC 1 engagements are performed in accordance with the Statement on Standards for Attestation Engagements No. 16 (SSAE 16). A SOC 1 assessment is comprised of control objectives, which are used to accurately represent internal control over financial reporting.

A SOC 2 report evaluates internal controls, policies, and procedures and reports on controls that directly relate to the security, availability, processing integrity, confidentiality, and privacy at a service organization. These criteria are known as the Trust Services Principles and are the foundation of any SOC 2 audit engagement. Audits are completed by independent qualified auditors.

Oracle Cloud Security

Oracle Cloud Services operates under practices which are aligned with the ISO/IEC 27002 Code of Practice for information security controls, from which a comprehensive set of controls are selected.

Oracle Physical Security Safeguards

Oracle employs measures designed to prevent unauthorized persons from gaining access to computing facilities in which Your Content is hosted such as the use of security personnel, secured buildings, and designated data center premises. Oracle provides secured computing facilities for both office locations and production cloud infrastructure. Common controls between office locations and Oracle controlled co-locations/data centers currently include, for example:

- Physical access requires authorization and is monitored.
- All employees and visitors must visibly wear official identification while onsite.
- Visitors must sign a visitor's register and be escorted and/or observed while onsite.
- Possession of keys/access cards and the ability to access the locations is monitored. Staff leaving Oracle employment must return keys/cards.
- Additional physical security safeguards are in place for Oracle-controlled Cloud data centers, which currently include safeguards such as:
- Premises are monitored by CCTV.
- Entrances are protected by physical barriers designed to prevent unauthorized entry by vehicles.
- Entrances are manned 24 hours a day, 365 days a year by security guards who perform visual identity recognition and visitor escort management.
- Safeguards related to environmental hazards.
- Any physical movement of equipment is controlled by hand-delivered receipts and other authorized change control procedures.
- Network cables are protected by conduits and, where possible, avoid routes through public areas.

System Access Controls

Oracle may apply among others the following controls: authentication via passwords and/or multi-factor authentication, documented authorization and change management processes, and logging of access.

log-ins to Cloud Services environments are logged and logical access to the data centers is restricted and protected.

User Encryption for External Connections

Access to Oracle Cloud Services is through a secure communication protocol provided by Oracle. If access is through a Transport Layer Security (TLS) enabled connection, that connection is negotiated for at least 128-bit encryption or stronger. The private key used to generate the cipher key is at least 2048 bits. TLS is implemented or configurable for all web-based TLS-certified applications deployed at Oracle. In some cases, a third-party site that is integrated with the Oracle Cloud Services, such as a social media service, may not accept an

encrypted connection. For Oracle Cloud Services where HTTP connections with the third-party site are permitted by Oracle, Oracle will enable such HTTP connections in addition to the HTTPS connection.

For more information see <https://www.oracle.com/corporate/security-practices/assurance/>

External Reviews

Oracle may employ third parties to conduct independent reviews of Cloud Services in the following areas (the availability and scope of reports may vary by service and country): SOC 1 (based on Statement on Standards for Attestation Engagements (SSAE) No 18) and/or SOC 2 reports.

AWS

AWS has certification for compliance with ISO/IEC 27001:2013, 27017:2015, and 27018:2014. These certifications are performed by independent third-party auditors. AWS compliance with these internationally-recognized standards and code of practice is evidence of its commitment to information security at every level of the organization, and that the AWS security program is in accordance with industry leading best practices.

Esri

ESRI ArcGIS Online utilizes cloud infrastructure providers including AWS and Microsoft Azure that are compliant with the following:

- ISO 27001
- FedRAMP
- SSAE16 SOC1 Type 2

For more details see the Amazon Web Services and Microsoft Azure websites.

ArcGIS Online has been granted a FedRAMP Tailored Low Authority to Operate (ATO). The security controls for this authorization align with National Institute of Standards and Technology (NIST) Special Publication 800-53 (Revision 4) which maps to International Standards Organization (ISO) 27001 & 15408 controls.

Esri as a company and its products are aligned with the following privacy standards/regulations:

- GDPR: General Data Protection Regulation

- Our company and products align with this regulation for handling EU citizen private information.
- Privacy Shield: Privacy assurance certification
 - Esri now has a general company privacy statement and a supplemental privacy statement providing enhanced privacy assurance for our products and services such as ArcGIS Online.

<https://trust.arcgis.com/en/>

SOC 2 Type 1 assessment and report (effective December 14, 2018).

For more information see <https://trust.arcgis.com/en/>

Security Monitoring for Multi-cloud

In addition to the security features employed by each individual cloud provider, events and data from the cloud systems will be monitored by the IBM QRadar SIEM in the Bulletproof Security Operations Centre (SOC). The SOC correlates events from multi systems, networks and user accounts and detects events that trigger investigation by the SOC support.

Appendix E Conceptual Technical Architecture and Privacy Protection (provided by Blue Spurs)

Conceptual Technical Architecture

Overview

The City of Fredericton will be utilizing Amazon Web Services AWS to implement the infrastructure needed to house the core of the Smart Cities Solution.

Amazon Web Services (AWS) is a secure cloud services platform, offering compute power, database storage, content delivery and other functionality to help businesses scale and grow and is very suitable to house Smart City Solutions.

In using AWS, the City of Fredericton (COF) will utilize a shared responsibility model for the solution. Specifically, this is as follows:

COF is responsible for the security of the following assets:

- Operating systems, Network & Firewall Configuration
- Applications
- Data in transit
- Data at rest
- Data stores
- Credentials
- Policies and configuration

AWS is responsible for and the owner of these assets:

- Facilities
- Physical security of hardware
- Network infrastructure
- Virtualization infrastructure

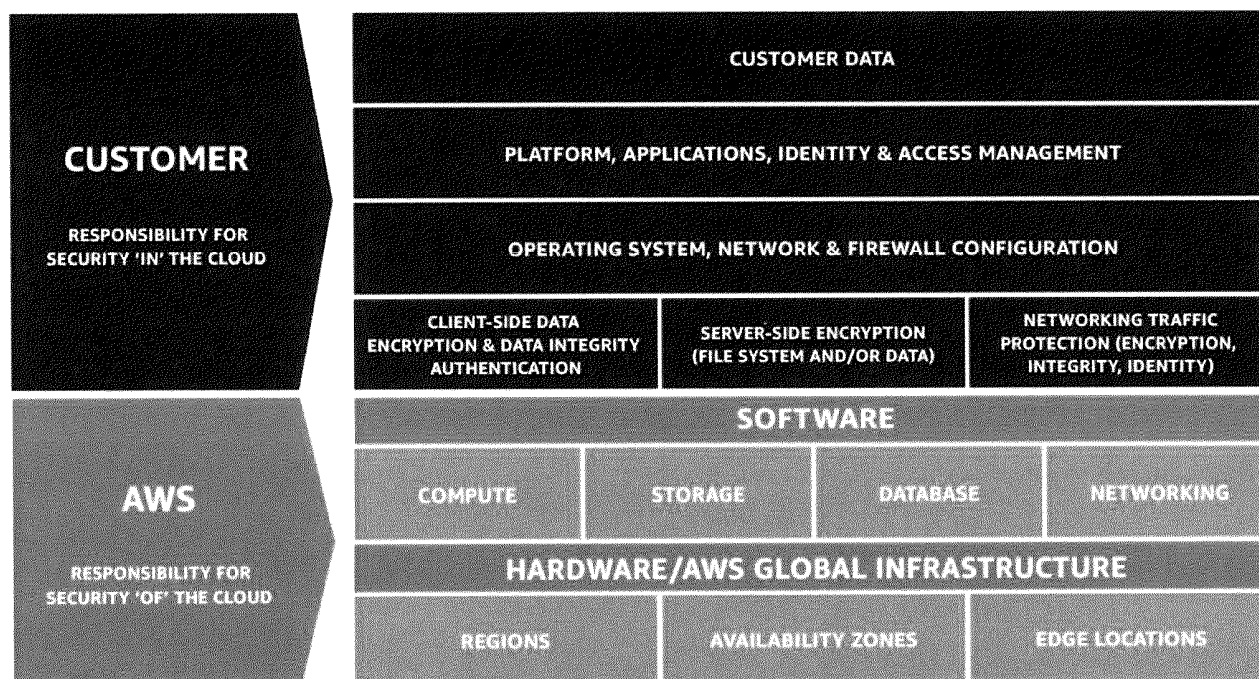


Figure 1.0 City of Fredericton / AWS shared responsibility model.

Details on City of Fredericton Responsibilities

Operating Systems, Network & Firewall Configuration

COF will secure all operating systems running the Smart City solutions. They will deploy firewalls to house all resources using Virtual Private Clouds (VPCs). This will allow COF to launch AWS resources into a secured virtual network that can be closely managed from an accessibility standpoint in AWS. VPCs are considered to be best practices in designing secured cloud infrastructures.

COF will also utilize the AWS Web Application Firewall (WAF) to protect web applications from common web exploits that could affect application availability, compromise security, or consume excessive resources. It will do this by defining customizable web security rules to block common attack patterns, such as SQL injection or cross-site scripting, and rules that are designed for your specific application.

Applications

To ensure that 3rd party applications added to the Smart City Solution are suitable for use, the COF will utilize application security assessments using Amazon Inspector. This service automatically assesses applications for vulnerabilities or deviations from best practices, including impacted networks, OS, and attached storage in AWS.

All Applications developed as part of this Smart City project will also be put through this service as well as follow best practices in securing all assets as part of the solution.

Data in Transit and at Rest

COF will utilize Transport Layer Security TLS to encrypt all data in transit from web interfaces as well as between services in AWS. They will use the Amazon Certificate Authority (Amazon Trust Services) to issue the appropriate certificates.

COF will utilize Amazon RDS to house the data at rest. This is a Relational Database Service (RDS) optimized for cloud. Amazon RDS uses encrypted DB clusters provide an additional layer of data protection by securing data at rest from unauthorized access to the underlying storage. This uses AES-256 Encryption.

COF will use the AWS Key Management Service (AWS KMS) to manage the keys used for encrypting and decrypting the Amazon RDS resources. This combines secure, highly available hardware and software to provide a key management system scaled for the cloud.

COF will create encryption keys and define the policies that control how these keys can be used. AWS KMS supports Cloud Trail which is an AWS service that can be used to audit all key usage to verify that keys are being used appropriately.

All logs, backups, and snapshots will be encrypted.

All authentication of access and decryption of the data are handled by AWS so the risk of exposing unencrypted data is minimal.

Credentials

COF will define, enforce, and manage user access policies across AWS services. This includes the use of several AWS services.

COF will utilize an Identity and Access Management Service (IAM) on all AWS resources. This will enable them to securely control access to AWS services and resources for all users. This will involve creating and managing AWS users and groups and utilizing permissions to allow and deny permissions to AWS resources.

This will be used to control access to Amazon actions to create, modify, or delete RDS resources such as database clusters, instances, security groups, or parameter groups, and actions that perform common administrative actions such as backing up and restoring database instances.

Best Practices include:

- Assign an individual IAM account to each person who manages RDS resources.
- Do not use AWS root credentials to manage Amazon RDS resources; create an IAM user for everyone.
- Grant each user the minimum set of permissions required to perform his or her duties.
- Use IAM groups to effectively manage permissions for multiple users.
- Rotate your IAM credentials regularly.

COF will also use AWS Multi Factor Authentication for privileged accounts, including options for hardware-based authenticators if needed. And finally, the AWS Directory Service will also be used to integrate and federate with corporate directories to reduce administrative overhead and improve end-user experience where required.

Policies and Configuration (Monitoring)

COF will use AWS Cloud Trail AND Amazon CloudWatch to enable governance, compliance by recording all resource access events in AWS. This will support governance and compliance by using Cloud Trail to view, search, download, archive, analyze, and respond to account activity across the AWS infrastructure. It will identify who or what took which action, what resources were acted upon, when the event occurred, and other details to help analyze and respond to activity in the infrastructure.

COF will also utilize the AWS Trusted Advisor to identify Security Gaps, enabling various security features and examining permissions.

COF will also subscribe to AWS Shield to help secure city services against Cyber threats. AWS Shield is a managed Distributed Denial of Service (DDoS) protection service that safeguards applications running on AWS. AWS Shield provides always-on detection and automatic inline mitigations that minimize application downtime and latency, so there is no need to engage AWS Support to benefit from DDoS protection.

Also when using AWS, organizations can rely on AWS' certification with robust security standards, such as ISO 27001, SOC 1,2, and 3 and PCI DSS Level 1. AWS customers can use familiar measures to protect their data, such as encryption and strong passwords, in addition to AWS security features like AWS Identity and Access Management.

Details on AWS Responsibilities

AWS data centers are secure by design and our controls make that possible. Before we build a data center, we spend countless hours considering potential threats and designing, implementing, and testing controls to ensure the systems, technology, and people we deploy counteract risk. To help you fulfill your own audit and regulatory requirements, we are providing you with insight into some of our physical and environmental controls below.

SECURE DESIGN

SITE SELECTION

Prior to choosing a location, AWS performs initial environmental and geographic assessments. Data center locations are carefully selected to mitigate environmental risks, such as flooding, extreme weather, and seismic activity. Our Availability Zones are built to be independent and physically separated from one another.

REDUNDANCY

Data centers are designed to anticipate and tolerate failure while maintaining service levels. In case of failure, automated processes move traffic away from the affected area. Core applications are deployed to an N+1 standard, so that in the event of a data center failure, there is sufficient capacity to enable traffic to be load-balanced to the remaining sites.

AVAILABILITY

AWS has identified critical system components required to maintain the availability of our system and recover service in the event of outage. Critical system components are backed up across multiple, isolated locations known as Availability Zones. Each Availability Zone is engineered to operate independently with high reliability. Availability Zones are connected to enable you to easily architect applications that automatically fail-over between Availability Zones without interruption. Highly resilient systems, and therefore service availability, is a function of the system design. Through the use of Availability Zones and data replication, AWS customers can achieve extremely short recovery time and recovery point objectives, as well as the highest levels of service availability.

CAPACITY PLANNING

AWS continuously monitors service usage to deploy infrastructure to support our availability commitments and requirements. AWS maintains a capacity planning model that assesses our infrastructure usage and demands at least monthly. This model supports planning of future demands and includes considerations such as information processing, telecommunications, and audit log storage.

BUSINESS CONTINUITY & DISASTER RECOVERY

BUSINESS CONTINUITY PLAN

The AWS Business Continuity Plan outlines measures to avoid and lessen environmental disruptions. It includes operational details about steps to take before, during, and after an event. The Business Continuity Plan is supported by testing that includes simulations of different scenarios. During and after testing, AWS documents people and process performance, corrective actions, and lessons learned with the aim of continuous improvement.

PANDEMIC RESPONSE

AWS incorporates pandemic response policies and procedures into its disaster recovery planning to prepare to respond rapidly to infectious disease outbreak threats. Mitigation strategies include alternative staffing models to transfer critical processes to out-of-region resources, and activation of a crisis management plan to support critical business operations. Pandemic plans reference international health agencies and regulations, including points of contact for international agencies.

PHYSICAL ACCESS

EMPLOYEE DATA CENTER ACCESS

AWS provides physical data center access only to approved employees. All employees who need data center access must first apply for access and provide a valid business justification. These requests are granted based on the principle of least privilege, where requests must specify to which layer of the data center the individual needs access, and are time-bound. Requests are reviewed and approved by authorized personnel, and access is revoked after the requested time expires. Once granted admittance, individuals are restricted to areas specified in their permissions.

THIRD-PARTY DATA CENTER ACCESS

Third-party access is requested by approved AWS employees, who must apply for third-party access and provide a valid business justification. These requests are granted based on the principle of least privilege, where requests must specify to which layer of the data center the individual needs access, and are time-bound. These requests are approved by authorized personnel, and access is revoked after request time expires. Once granted admittance, individuals are restricted to areas specified in their permissions. Anyone granted visitor badge access must present identification when arriving on site and are signed in and escorted by authorized staff.

MONITORING & LOGGING

DATA CENTER ACCESS REVIEW

Access to data centers is regularly reviewed. Access is automatically revoked when an employee's record is terminated in Amazon's HR system. In addition, when an employee or contractor's access expires in accordance with the approved request duration, his or her access is revoked, even if he or she continues to be an employee of Amazon.

DATA CENTER ACCESS LOGS

Physical access to AWS data centers is logged, monitored, and retained. AWS correlates information gained from logical and physical monitoring systems to enhance security on an as-needed basis.

DATA CENTER ACCESS MONITORING

We monitor our data centers using our global Security Operations Centers, which are responsible for monitoring, triaging, and executing security programs. They provide 24/7 global support by managing and monitoring data center access activities, equipping local teams and other support teams to respond to security incidents by triaging, consulting, analyzing, and dispatching responses.

SURVEILLANCE & DETECTION

CCTV

Physical access points to server rooms are recorded by Closed Circuit Television Camera (CCTV). Images are retained according to legal and compliance requirements.

DATA CENTER ENTRY POINTS

Physical access is controlled at building ingress points by professional security staff utilizing surveillance, detection systems, and other electronic means. Authorized staff utilize multi-factor authentication mechanisms to access data centers. Entrances to server rooms are secured with devices that sound alarms to initiate an incident response if the door is forced or held open.

INTRUSION DETECTION

Electronic intrusion detection systems are installed within the data layer to monitor, detect, and automatically alert appropriate personnel of security incidents. Ingress and egress points to server rooms are secured with devices that require each individual to provide multi-factor authentication before granting entry or exit. These devices will sound alarms if the door is forced open without authentication or held open. Door alarming devices are also configured to detect instances where an individual exits or enters a data layer without providing multi-factor authentication. Alarms are immediately dispatched to 24/7 AWS Security Operations Centers for immediate logging, analysis, and response.

DEVICE MANAGEMENT

ASSET MANAGEMENT

AWS assets are centrally managed through an inventory management system that stores and tracks owner, location, status, maintenance, and descriptive information for AWS-owned assets. Following procurement, assets are scanned and tracked, and assets undergoing maintenance are checked and monitored for ownership, status, and resolution.

MEDIA DESTRUCTION

Media storage devices used to store customer data are classified by AWS as Critical and treated accordingly, as high impact, throughout their life-cycles. AWS has exacting standards on how to install, service, and eventually destroy the devices when they are no longer useful. When a storage device has reached the end of its useful life, AWS decommissions media using techniques detailed in NIST 800-88. Media that stored customer data is not removed from AWS control until it has been securely decommissioned.

OPERATIONAL SUPPORT SYSTEMS

POWER

Our data center electrical power systems are designed to be fully redundant and maintainable without impact to operations, 24 hours a day. AWS ensures data centers are equipped with back-up power supply to ensure power is available to maintain operations in the event of an electrical failure for critical and essential loads in the facility.

CLIMATE AND TEMPERATURE

AWS data centers use mechanisms to control climate and maintain an appropriate operating temperature for servers and other hardware to prevent overheating and reduce the possibility of service outages. Personnel and systems monitor and control temperature and humidity at appropriate levels.

FIRE DETECTION AND SUPPRESSION

AWS data centers are equipped with automatic fire detection and suppression equipment. Fire detection systems utilize smoke detection sensors within networking, mechanical, and infrastructure spaces. These areas are also protected by suppression systems.

LEAKAGE DETECTION

In order to detect the presence of water leaks, AWS equips data centers with functionality to detect the presence of water. If water is detected, mechanisms are in place to remove water in order to prevent any additional water damage.

INFRASTRUCTURE MAINTENANCE

EQUIPMENT MAINTENANCE

AWS monitors and performs preventative maintenance of electrical and mechanical equipment to maintain the continued operability of systems within AWS data centers. Equipment maintenance procedures are carried out by qualified persons and completed according to a documented maintenance schedule.

ENVIRONMENT MANAGEMENT

AWS monitors electrical and mechanical systems and equipment to enable immediate identification of issues. This is carried out by utilizing continuous audit tools and information provided through our Building Management and Electrical Monitoring Systems. Preventative maintenance is performed to maintain the continued operability of equipment.

GOVERNANCE & RISK

ONGOING DATA CENTER RISK MANAGEMENT

The AWS Security Operations Center performs regular threat and vulnerability reviews of data centers. Ongoing assessment and mitigation of potential vulnerabilities is performed through data center risk assessment activities. This assessment is performed in addition to the enterprise-level risk assessment process used to identify and manage risks presented to the business as a whole. This process also takes regional regulatory and environmental risks into consideration.

THIRD-PARTY SECURITY ATTESTATION

Third-party testing of AWS data centers, as documented in our third-party reports, ensures AWS has appropriately implemented security measures aligned to established rules needed to obtain security certifications. Depending on the compliance program and its requirements, external auditors may perform testing of media disposal, review security camera footage, observe entrances and hallways throughout a data center, test electronic access control devices, and examine data center equipment.

Appendix F NB-IRDT Overview Document

NB-IRDT Overview for Data Transfer Partners

September 2018



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1. NB-IRDT Infrastructure

1.1 Data Research Centre

The New Brunswick Institute for Research, Data and Training (NB-IRDT) is a research institute located on the University of New Brunswick (UNB) Fredericton campus. The Institute facilitates evidence-based research to provide government, academics, and researchers with solid information to inform decisions that affect New Brunswick citizens... Operating at arms' length from government, NB-IRDT is able to provide the environment to conduct scholarly research on questions related to health and social issues/prosperity for our generation and those to come

The primary function of NB-IRDT is to securely store linkable pseudonymous administrative data sets and facilitate research by providing secure access to these data. The Institute currently hosts more than ten pseudonymous individual level linkable data sets from Horizon Health Network and the Department of Health. These data sets are currently accessible to approved researchers at the Fredericton NB-IRDT secure facility, with satellite sites in Moncton and Saint John opening in fall 2018.

1.2 Legislation Authority

In January of 2014, the University of New Brunswick (UNB), representing NB-IRDT, entered into an *Originating Agreement* with the New Brunswick Department of Health (DH) on behalf of the province of New Brunswick establishing NB-IRDT as a "data research institute" as defined in the provincial *Personal Health Information Privacy and Access Act, c.P-7.05* (PHIPAA). As a data research centre, NB-IRDT is a data custodian and serves as a secure central location for approved researchers to access pseudonymous provincial administrative data sets of personal information and personal health information.

In May 2017, the New Brunswick *Act Respecting Research c.29* received proclamation. This act serves an important role in providing clarity and addressing gaps in the access and use of personal data and personal health data for research. This new Act works in tandem with the *Personal Health Information Privacy and Access Act* (PHIPPA), the *Right to Information and Protection of Privacy Act* (RTIPPA) and other relevant legislation. The *Act Respecting Research* has opened the doors for NB-IRDT to build strong partnerships with data custodians and business owners throughout the Government of New Brunswick. NB-IRDT may now receive not only transferred pseudonymous personal health data but also pseudonymous personal data not specifically related to health.

Facilitating the transfer of personal information are the addition of sections 37.1, 47.1 (1) and 47.1(2) to the *Right to Information and Protection of Privacy Act, c.R-10.6*.

Document title	Authority Provided	Addressed Concern
Act Respecting Research Ch. 29	Proclaimed May 24, 2017	Provided necessary amendments to PHIPAA & RTIPPA for data disclosure to a data research centre
PHIPAA P-7.5	Consolidated May 24, 2017	Authority to disclose PHI to a data research centre
RTIPPA R.10-6	Consolidated December 20, 2017	Authority to disclose PI to a data research centre

1.3 Governance

NB-IRDT is governed by three advisory committees, each serving a different role in overseeing the development and growth of NB-IRDT as well as ensuring compliance with requirements as stated in the legislation for a data research centre. In addition, a joint Department of Health and NB-IRDT Collaboration Committee provides support with the facilitation of data privacy and security requirements. The following paragraphs outline the key roles of each committee.

1) Partnership Coordination Committee (PCC)

The PCC provides high-level guidance and direction to the NB-IRDT's Strategic Directions Committee and the Director in ensuring the sustainability and continuing operation of NB-IRDT. The PCC reviews the Strategic Plan and assesses the subsequent effectiveness of NB-IRDT in meeting the objectives set out within that Strategic Plan. The PCC also provides guidance and direction in ensuring that NB-IRDT is operating in accordance with its mission statement and mandate. A key function of the PCC is providing a forum within which senior administrators from Government, Academia, Regional Health Networks, New Brunswick Health Research Foundation, and other organizations and funding agencies can develop strategic relationships and integrate NB-IRDT into their own planning and priority setting where appropriate and mutually beneficial.

2) Strategic Directions Committee (SDC)

SDC advises the NB-IRDT Director in setting and implementing the strategic direction of NB-IRDT, and supports the NB-IRDT Director and GNB partners in meeting NB-IRDT's goals. This includes supporting the process of developing research priorities; identifying and developing potential funding sources for research and data development; expanding the data holdings of NB-IRDT from GNB Departments including but not limited to Health, Social Development, Post-secondary Education, Training and Labour, and Education and Early Childhood Development as well as from other organizations such as Regional Health Networks; encouraging policy-oriented research activity; developing the Strategic Plan; and contributing to NB-IRDT's longer term planning. The SDC provides higher-level guidance of research deliverables for GNB. Members of the SDC will also liaise with the planning committees of the New Brunswick node of MSSU and other CIHR SPOR programs where appropriate in order to ensure continued alignment with common objectives.

3) Data and Research Committee (DRC)

The DRC includes representatives from the Executive Council Office, Department of Health and the Chief Information Access and Privacy Officer. The NB-IRDT Director also serves on this committee as will a representative from the research associates and the NB-IRDT Project Coordinator. The DRC will also include business owners from other public bodies who have provided data to NB-IRDT. The DRC Chair is appointed jointly by NB-IRDT and GNB for a term of two years.

The DRC provides a forum to discuss issues relevant to database transfers and data linkage procedures, serves as a forum for consultation on procedural changes, and at least once per year, the DRC organizes a forum to present results of projects to GNB and other stakeholders. In addition, DRC assembles working groups (DRC-WG) to review and provide feedback on Data Access Applications received from researchers seeking access to administrative data sets held at NB-IRDT, as well as draft reports from these projects. It is through DRC-WG members reporting back to their respective departments that relevant stakeholders are informed of the outcomes of the research prior to public dissemination.

The DRC-WG consists of DRC members plus business owners (or their delegate) from each public body from which data are proposed to be accessed by the researcher, the NB-IRDT Privacy Officer, NB-IRDT Database Administrator and additional members as deemed appropriate. Should any member of the DRC-WG be involved in the research project being reviewed, he/she cannot participate in the review. In the event that the NB-IRDT Director or appointed research associate are both involved in the research project, NB-IRDT is represented by the Executive Director of Research Services from UNB or his/her designate. In the event that a business owner is a researcher, another suitable person is selected from within that public body. Researchers are also invited to attend working group meetings to expand on details in their submissions or answer questions.

4) Collaboration Committee (CC)

The CC is a permanent committee of Department of Health (DH) and New Brunswick Institute for Research, Data and Training (NB-IRDT). The committee was established for the purposes of: administration of the Originating Agreement signed by the DH and the NB-IRDT in January of 2014; supporting the NB-IRDT to be accountable in its data privacy and security obligations while serving as a central location for researchers to access a variety of provincial administrative data sets; facilitating operational and reporting requirements per the Originating, Operational and Master Data Sharing Agreements held between NB-IRDT and Department of Health; and, establishing working groups or sub-committees as needed. The Collaboration Committee is advisory to the Deputy Minister of the DH and the Vice-President (Research) UNB.

1.4 NB-IRDT Staffing

As a University of New Brunswick research institute, NB-IRDT employs a growing group of highly trained and skilled individuals specializing in the secure access and use of pseudonymous personal information. While some individuals hold almost exclusively administrative and operational roles (e.g. administrative assistant, operations manager) others span the boundaries between operations and data work (e.g. project coordinator, privacy officer, or research coordinator); still others work directly with the data (e.g. database administrator, researchers, data analysts and research assistants). Regardless of their individual roles, NB-IRDT staff strive to provide secure access to reliable high quality administrative data. All staff receive annual data privacy and security training, and the implementation of identified privacy practices are integrated into all work process.

The following are brief descriptions of NB-IRDT positions with identified administrative, physical and or technical safeguards responsibilities for data privacy and security. These descriptions by no means represent the full set of tasks or duties assigned to these positions nor are all positions within the NB-IRDT team included without whom we would not be able to operate as a data research centre.

5) Director

Following the guidance of the Partnership Coordination Committee and, the advisory direction of the Strategic Directions Committee the operation of NB-IRDT is overseen by its Director. The NB-IRDT Director plays a decisive role in the staff appointments, research directions and development of data lines of business, services and expansion of the data platform.

6) Data Planning and Development Coordinator

The Data Planning and Development Coordinator is responsible for leading and overseeing the strategic planning and execution of collecting administrative data from the Government of New Brunswick, multiple external agencies and stakeholders, such as Regional Health Authorities and private sector groups, to transfer to the NB-IRDT data platform.

7) Project Coordinator

The Project Coordinator plays a pivotal role for all researchers seeking to access the data housed in NB-IRDT's secure custody. The Project Coordinator receives the intake of *Data Access Applications* and serves as the point person for applicants assisting with questions and applications concerns. Not only does the Project Coordinator ensure the application process moves forward by managing the application review processes but the Coordinator also guides applicants through the necessary administrative steps to becoming an approved user. The position serves, as the facilitator of the Data Research Committee, initiates dialogue with would be data partners for researchers seeking access to external data not currently held by NB-IRDT.

8) Privacy Officer

As the point person for data privacy and security, the Privacy Officer is accountable for data protection throughout the data life cycle at NB-IRDT. The roles advise and provide oversight with respect to data collection, access, use, dissemination, retention and disposition. The Privacy Officer also advises and monitors NB-IRDT's compliance with federal and provincial legislation relating to the access, use and dissemination of personal information (PI) and personal health information (PHI). Responsibilities include reviewing the Institute's authority to receive data transfers, data access application privacy reviews, institute policy and procedure development and maintenance, conducting routine privacy assessment and advising data partners on privacy impact assessments, providing approved user and staff data privacy and security training, and advising on data quality management decisions and vetting dissemination practices.

9) Systems Administrator

The Systems Administrator serves an important role not only in security of the facility and information technology support but with data security matters in general, such as assisting with auditing and reporting, regular lab software and hardware maintenance, user lab access and account security, internal server maintenance and other IT related tasks. The Systems Administrator works closely with the Privacy Officer to identify physical and technical safeguards for data protection and with the Database Administrator for the secure receipt and of pseudonymous data to the NB-IRDT data platform.

10) Database Administrator

The Database Administrator position is central to the provision of secure access to pseudonymous data at NB-IRDT. Holding advanced expertise database design and understanding of variable contents, the position is responsible for the secure physical receipt of data and mounting of data to the NB-IRDT data platform. The Database Administrator controls data access to approved data users by ensuring the appropriate access to only the approved data sets and variables. Provision of access may include preparation of data by conducting approved linking of data sets when appropriate, aggregation of data variables or data management tasks such as deletion of variables not approved for user access. The Database Administrator advises on and provides essential physical and technical safeguards through the

supervision of all data user access account activities, data usage through project folder management and the vetting of requested aggregate results for dissemination.

11) Research Coordinator

The Research Coordinator organizes the assignment of project responsibilities to individual data support positions. This includes the assignment of data set and analytical expertise to the appropriate projects and the balancing of workload responsibilities. The Research Coordinator assists with all phases of the project preparation, and facilitates project progress and completion by assisting with mitigation of identified data resources needs (e.g. data dictionary development, data set variable clean up, etc.). In addition, the Research Coordinator supports the identification and management of researchers' (both internal and external approved users) data analytical needs and works with NB-IRDT data analysts and research assistants to identify solutions.

12) Data Analysts

Data analysts play a significant role in assisting researchers with research protocol and methods for use with administrative data. As experts in data programming and software, these individuals are responsible for a variety of project and data set support activities including program advising, data documentation, and data quality management. Increasingly, NB-IRDT data analysts are addressing identified metadata dictionary development, data quality assurance needs and related data management practices.

13) Research Assistants

With unique data set and subject areas of expertise, research assistants work collaboratively with researchers, data analysts and the Database Administrator to support research projects. These positions are able to both advise on and execute the research methods necessary for project data work. In addition, because of their expertise, research assistants contribute to the data platform development through data clean-up work, data dictionary development and increasingly by providing data set knowledge to would be partners and researchers (e.g. meeting with prospective researchers to discuss current data holdings available for request through data access application.)

1.5 Agreements

14) Originating & Operating Agreements

In addition to the January 2014 *Originating Agreement* signed between UNB and the Department of Health on behalf of the province, UNB on behalf of NB-IRDT, entered in a signed *Operating Agreement* outlining its obligations as a custodian. These agreements provide NB-IRDT with the necessary authority to act as a research center, to serve as an information manager, an agent and a custodian. They work in tandem with the authority provided for in legislation for NB-IRDT to receive the transfer of personal information data sets from data business owners, custodians and public bodies in New Brunswick.

15) Memorandum of Understanding (MOU)

The MOU was developed to provide a governance framework for the continued relationship between GNB and UNB (NB-IRDT) as the principal repository of data sets for research purposes and the primary research and training institute for GNB. It outlines the roles and responsibilities of individuals within the organization, and commitments between NB-IRDT and GNB.

16) Data Sharing Agreement

NB-IRDT uses the Data Sharing Agreements (DSA) and Master Data Sharing Agreements (MDSA) as formal contracts for the transfer of data collected by non-profit, government, private industry, or academic body where the data are non-public or otherwise restricted in use. A (n) (M) DSA clearly documents the parameters of the data to be transferred, the data usage and access, defined data retention times, and final disposition of the data. These agreements serve two purposes: to protect the owner, ensuring the data will not be misused, and to prevent any miscommunication between the provider of the data and NB-IRDT by making certain that any questions about data transfer, use, access, retention and disposition are discussed before data is shared.

Master Data Sharing Agreements are used when partnerships are formed between data business owners who plan to transfer numerous data sets over time; they outline the general terms and conditions of transferring data. Data Sharing Agreements are used for one-time transfer of individual data sets.

NB-IRDT currently holds several DSAs and MDSAs with the Department of Health and the two provincial Regional Health Authorities (Horizon and Vitalite), and is in the process of establishing an MDSA with other public bodies.

As an extension of the Data Sharing Agreement and Master Data Sharing Agreement, an Appendix and Individual Disclosure Schedule (IDS) is created, respectively. The Appendix of the DSA will detail the data set variables to be transferred. The IDS of the MDSA will outline the specifics of each data set, including schedules, list of variables, etc.

2. Privacy & Security

A secure facility, NB-IRDT houses a stand-alone closed network of servers and workstations with multiple physical and virtual firewalls. Researchers seeking to access NB-IRDT resources are required to follow a formal application process, which includes the review of a research ethics board, a scientific peer review (if requested), the review of the NB-IRDT Data and Research Committee, and a privacy and legislation compliance review by the NB-IRDT Privacy Officer.

Prior to transfer to NB-IRDT, all data sets are rendered pseudonymous with the removal or scrambling of information that would directly identify an individual. Data are stored in an unlinked form and project specific custom data sets are generated with only predefined variables once a research project has been granted approval. All data access research work must be completed onsite within the secure environment of NB-IRDT. NB-IRDT uses a variety of physical, technical and administrative safeguards to protect the information held in its custody.

c) 2.1 Safeguards

Under legislation and following best practices for data privacy there are three types of safeguards used at NB-IRDT to help ensure the safety and security of personal information and personal health information.

17) Administrative Safeguards

Policies

To help ensure the privacy and security of the all data held at the NB-IRDT, 11 policies have been developed and adopted to regulate and ensure compliance with data life cycle processes. These policies are not only geared specifically for the privacy and security of all data held at NB-IRDT but were developed in consultation with our data partners and other key stakeholders (e.g. the former Privacy Commissioner, the University Secretariat, etc.) when appropriate, and received final approval by the UNB Vice President (Research). All NB-IRDT Policies are available on institute website at <http://unb.ca/nbirdt>

- [Access to Information Policy](#)
- [Conflict of Interest Policy](#)
- [Data Confidentiality and Security Policy](#)
- [Data Retention Destruction and Restoration Policy](#)
- [Dissemination of Research Findings](#)
- [Facility Security Policy](#)
- [Mobile Device Policy](#)
- [Password Policy](#)
- [Breach of Privacy Policy](#)
- [NB-IRDT User Access Account Policy](#)

Confidentiality, Data Access Agreements & Training

Prior to any approved access to data, all researchers are required to present a criminal record check and sign confidentiality agreements with UNB stating their commitment to safeguard any data accessed and agreement to follow the data policies of NB-IRDT. Principal investigators on behalf of themselves and their research teams enter into *Data Access Agreements* with the UNB to acknowledge their understanding of the responsibilities of accessing personal information in the custody of NB-IRDT and their commitment to safeguard any data accessed in the course of their research. Finally, all approved users are required to participate in a privacy training session (annual renewal required) and a secure facility training and orientation session.

18) Physical Safeguards

NB-IRDT employs several physical safeguards to help ensure the security of the data in its custody. Many of these are identified in the data policies. Examples include the requirement for two-factor authentication to enter the secure facility and the configuration of moated work stations physically removing any options for using work stations for activities other than approved data work.

19) Technical Safeguards

Numerous technical safeguards are in place to protect the data held in NB-IRDT's custody. As outlined in the NB-IRDT policies, they include the use of unique user sign-on and passwords, no data storage capabilities on workstations, and no use of mobile devices by approved users in the secure facility.

d) 2.2 Assessments

Assessment and risk analysis processes are used to weight the risk and benefits at all stage of the data life cycle, data collection, use, access, dissemination, retention and disposition. The following are in keeping with not only data privacy and security best practices, but are also requirements as set in

legislation and as agreed to in the NB-IRDT Originating and Operating Agreements with the province of New Brunswick.

20) Privacy Impact Assessment (PIA)

A PIA completed for NB-IRDT as an institution examines NB-IRDTs governance and infrastructure, operating agreements, legislative authorities and obligations, lines of business, data flow, administrative, physical and technical safeguards and provides risk identification and mitigation recommendation. PIAs are conducted every 5 years or sooner when triggered by any changes in data life cycle processes of NB-IRDT. In March 2015 a Privacy Impact Assessment of all NB-IRDT data practices was completed. With the opening of two NB-IRDT satellite secure facilities located on the UNB Saint John and Université de Moncton campuses a Supplemental PIA was completed in July 2018 to review data privacy and security practices (NB-IRDT PIAs are available on request).

21) Threat and Risk Assessment (TRA)

TRAs review and contemplate the security risks associated with data transfer to NB-IRDT platform, and the access and storage of data at NB-IRDT. TRAs are exhaustive risk assessments examining all administrative, physical, and technical safeguards associated with the data life cycle. TRAs are completed on the physical and technical security of the NB-IRDT facility every 3 years, or sooner, when triggered by any changes in data life cycle processes of NB-IRDT. A Threat and Risk Assessment was completed for NB-IRDT in June of 2017 followed by a TRA Supplement in July 2018. The TRA Supplement examines the data security for the opening of the two NB-IRDT satellite secure facilities located on the UNB Saint John and Université de Moncton campuses (NB-IRDT TRAs are available on request).

22) Transfer Data Set PIAs

Within provincial legislation, there are various triggers for the completion of a privacy impact assessment (PIA). Most often, these triggers are in relation to the new collection, use or disclosure of personal information. Included among these triggers is the transfer of personal information to a data research centre. The exercise of completing these focused PIAs concerning the transfer of data sets to NB-IRDT allows data business owners to verify that the appropriate data privacy and security practices in place and to identify any potential risks and necessary mitigating measures to reduce risk.

3. Lines of Business

NB-IRDT offers five data-related lines of business. These lines of business are at the core of NB-IRDT's data platform development and provision of secure data access.

23) Data Platform Development

This line of business includes the receiving of new data sets from data custodians or business owners including Government of New Brunswick custodians (Part I, II, III)²¹. This process includes the signing of a Data Sharing Agreement (or similar) between data custodians/business owners and the University of New Brunswick (UNB) as NB-IRDT's signing authority, the secure transfer of administrative data to be

²¹ Part I includes the departments, which are often referred to as the civil service. Part II is comprised of the school system including teachers, bus drivers, and school district employees. Part III encompasses all health sector employees.

stored on the NB-IRDT data platform and preparation to make data available to researchers through the Data Access Application process.

24) Access & Use of Data

This line of business enables access to and use of NB-IRDT's facilities and data by approved users for research projects. Research projects may be investigator-driven or government-initiated. The approved research project may require use of data contained in one or more data holdings in the NB-IRDT data platform (with or without linking). In both cases, a new data set for researcher use is created. NB-IRDT may also act as an agent (as defined under PHIPAA) for the government department (with respect to PHI) if the department requests NB-IRDT to carry out the research on its behalf.

25) Access & Use Linked to External Data Sets

This line of business enables access to and use of the Institute's facilities and data holdings by approved users for research requiring linking between data held on the NB-IRDT platform with a data set provided by an additional custodian (public body, data business owner or researcher). This additional data will not become part of the NB-IRDT data platform (for which NB-IRDT acts as an Information Manager).

26) Information Management

This line of business provides the physical infrastructure and data platform for data custodians and data business owners to securely store and have secure access to their Personal Information administrative data sets. As an Information Manager (as defined by PHIPAA) NB-IRDT also offers information management services to data custodians or business owners such as standardizing, formatting, or cleaning data sets.

This service does not provide any access or use of data contained in one or more data holdings in the NB-IRDT data platform (with or without linking).

NB-IRDT may also act as an agent (as defined under PHIPAA) for the data custodian if the data custodian or business owner requests NB-IRDT to carry out additional responsibilities beyond the scope of an Information Manager. NB-IRDT offers three principle Information Management services:

- 1) Receive, store, retrieve, archive or dispose of PI and PHI
- 2) Provide third party secure data access for users who have entered into a data sharing agreement with the data business owner for whom NB-IRDT is acting as Information Manager
- 3) Provide value added information management services such as data quality assurance, standardizing, formatting, or cleaning data sets for use.

27) Administrative Inquiry

Reserved specifically to address the provision of Administrative Inquiry services, this line of business is administered within set terms and conditions as agreed to in a written agreement between UNB (for NB-IRDT) and the province of New Brunswick. The scope and details of all data analytical work under the Administrative Inquiry line of business are clearly identified and only data for which public bodies are the data business owner will be accessed.

4. Data Transfer

e) 4.1 Documentation

In accordance with legislation and data, and privacy and security best practices, there are specific steps that must be taken prior to data transfer from data business owners to NB-IRDT. Staff at NB-IRDT such as the Data Planning and Development Coordinator, the Privacy Officer and Department of Health Staff are available to work with data business owners to help with these processes and documentation. Such documents may include the following and templates are available:

- 1) Data Sharing Agreement between agency and NB-IRDT
- 2) Data Sharing Agreement between agency and Department of Health (for data preparation)
- 3) Crosswalk application
- 4) Protocol 8 –the department of health
- 5) Data flow chart

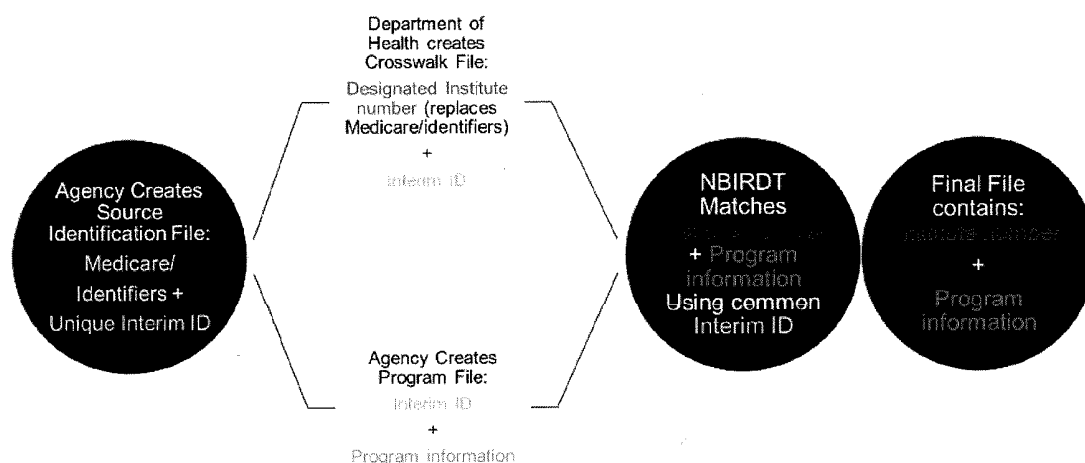
f) 4.2 Data Transfer and Crosswalk

To help ensure the privacy and security of personal information at all times, very specific steps must be taken to transfer data between a data business owner and a data research centre such as NB-IRDT. Most importantly, data is prepared in such a way that unique identifiers are removed prior to receipt at NB-IRDT, while still maintaining the information that is necessary for research work.

The necessary process includes the data owner splitting the data set into two files: the Source Identification file (SID) and the Program File. The Source Identification file contains direct identifiers (e.g. Medicare numbers, name, sex, age etc.) and a unique Interim ID (IID), generated by the data owner. This file is securely transferred to the Department of Health (DH).

The program file contains program information (i.e. variables), and the same unique Interim ID from the SID file. The program file is securely transferred to NB-IRDT. It does not contain direct/unique identifiers.

The DH strips the SID file from all direct identifiers and replaces them with an Institute number. This new file is called the Crosswalk File, and it is sent to NB-IRDT. The Database Administrator at NB-IRDT cross-references the Crosswalk and Program files to link the data.



28) Figure 4.1: Flow chart of the crosswalk process

g) 4.3 Data Access

Researchers seeking to access data held on the NB-IRDT platform will complete a detailed application process. Their application undergoes review from the University, Office of Research Services, and the Research Ethics Board. Once approved, the researcher must also sign a data access agreement, a confidentiality agreement, and undergo privacy and confidentiality training (see Section 2.1).

5. More Information

NB-IRDT provides a central location for researchers to access many provincial administrative data sets to facilitate research and answer questions that will empower government to stretch public dollars, anticipate the needs of a changing population, and encourage growth.

h) 5.1 Contact Information

We are committed to providing assistance to data owners and researchers alike to facilitate research on a broader scale. If you have, any questions about the information provided here or would like more information about NB-IRDT, please visit our webpage or contact us directly:

Data Planning and Development Coordinator

Melanie Buyting

T: 506-458-7731

E: Melanie.buyting@unb.ca

Privacy Officer

Donna Curtis Maillet

T: 506-443-3927

E: donna.curtismaillet@unb.ca

Project Coordinator

Jennifer Moorcraft

T: 506-447-3320

E: Jennifer.moorcraft@unb.ca

For general inquiries, contact us by **phone**: 506-447-3363 or **e-mail**: nb-irdt@unb.ca.

i) 5.2 Documents and Templates Available on Request

- Diagram(s) of the NB Department of Health 'Crosswalk Procedure' diagram
- NB-IRDT Approval Access Diagram
- Terms of Reference for the NB-IRDT Committees
 - Partnership Coordination Committee
 - Strategic Directions Committee
 - Data and Research Access
 - Collaboration Committee
- NB-IRDT Privacy Impact Assessment March 2015

- NB-IRDT Privacy Impact Assessment Supplement July 2018
- NB-IRDT Threat and Risk Assessment June 2017
- NB-IRDT Threat and Risk Assessment July 2018
- Master Data Sharing Agreement
- Individual Disclosure Schedule

Appendix G HIFIS4 Information

The information below has been copied directly from the Government of *Canada's Homeless Individuals and Families Information System* webpage accessed at <https://www.canada.ca/en/employment-social-development/programs/communities/homelessness/nhis/hifis.html#hifis4>

HIFIS 4

HIFIS 4 is the latest version of the HIFIS software. It is designed to make data integration safe and easy for users. It can be implemented over a wide network and accessed from a variety of Web-enabled devices, such as laptops, smartphones and tablets. Comprehensive user rights, client visibility and confidentiality practices help ensure that the data is not compromised.

Its design makes it a useful tool for a coordinated system of service delivery. Imagine a system where everyone trying to help a client has access to the same information – that individual can be referred to the support services that will best help them, without having to tell their story multiple times.

HIFIS is offered at no cost and provides the following benefits to service providers:

- Allows the tracking of support services, such as shelter admissions, case management, client assessments, goods and services.
- Includes comprehensive reporting functions and access to assessment tools such as the Service Prioritization Decision Assistance Tool (SPDAT) and Vulnerability Assessment Tool (VAT).
- Offers the latest standards in privacy and confidentiality to protect clients while allowing information to be shared across a community's system of social supports.
- Supports data sharing at the local, regional and national levels.
- Gives access to free technical support through the HIFIS Support Desk, as well as online and in-person training.

Data Provision Agreement

Download the [PDF version \(138 KB\)](#) of this content.

Table of Contents

- HIFIS Background
 1. Entire Agreement
 2. Purpose of this Agreement
 3. Licence
 4. Things you may do
 5. Things you may not do
 6. Roles and responsibilities
 7. ESDC obligations relating to the use and disclosure of personal information
 8. Information management and security
 9. Warranty and disclaimer
 10. Liability and indemnification
 11. Confidentiality
 12. Termination
 13. Designated officials
 14. General provisions
- Appendix A: HIFIS export fields

Service providers will need to sign the Data Provision Agreement (DPA) before activating version 3.8 and subsequent versions of the HIFIS software, unless they operate in provinces where a separate DPA is being negotiated at the provincial level.

This agreement must be signed by an official signing authority for each service provider that will share HIFIS data with the Government of Canada and by the Director General of the Homelessness Partnering Strategy (HPS).

APPENDIX H - Office of the Integrity Commissioner (OIC) Response to Preliminary Privacy Impact Assessment

Please see attached.

Completed by:

Robert P. Doherty – Access and Privacy Services

[Redacted Signature]

Date:

02/19/2019

Reviewed by: Project Manager, Fredericton Smart Cities

[Redacted Signature]

Date:

03/01/2019

Recommended by: Fredericton Smart Cities Privacy Sub-Committee

[Redacted Signature]

Date:

03/01/2019

Approved by: Executive Chair Fredericton Smart Cities Task Force

[Redacted Signature]

Date:

03/01/2019

Jacaban2, Evalynne (INFC)

From: Bell, Adam <Adam.Bell@Fredericton.ca>
Sent: March 4, 2019 2:43 PM
To: SC / VI (INFC)
Subject: Final Proposal - City of Fredericton and Saint Mary's First Nation 5 of 6
Attachments: Integrity Commissioner Response PPIA (7 Feb 19).pdf

Please find attached City of Fredericton and Saint Mary's First Nation Response from the Office of the Integrity Commissioner with respect to our Preliminary Privacy Impact Assessment.

This email is five of six that includes the following

1. Final proposal
2. Letters of Support
3. Finalist Video link to download video
4. Preliminary Privacy Impact Assessment
5. **Response from the Office of the Integrity Commissioner**
6. Long text descriptions for accessibility requirements and transcripts

Point of Contact:

Adam Bell, [REDACTED]
Assistant Director – Finance, Innovation & Technology
City of Fredericton
335 Queen St.
Fredericton NB, E3B 1B1
Phone: (506) 460-2182
Cell: (506) 478-2234

"Partnering with others to support our organization in making Fredericton the best place to live, work and play."

www.Fredericton.ca

Adam.Bell@Fredericton.ca





February 7, 2019

Laurie Guthrie
Smart Cities Project Manager
City of Fredericton
325 Queen Street
Fredericton NB E3B 1B1

Ms. Guthrie:

**Re: Comments from the Office of the Integrity Commissioner: Fredericton Smart Cities Proposal:
Preliminary Privacy Impact Assessment**

Further to our meeting at our Office on January 8, 2019 and the Preliminary Privacy Impact Assessment (PPIA) as submitted to our Office on January 25, 2019 regarding the City of Fredericton's Smart Cities proposal to Infrastructure Canada's Smart Cities Challenge, I am writing to provide this Office's input and feedback on the PPIA. I understand that, as a finalist in the Smart Cities Challenge, the City is required to engage with our Office as the Provincial privacy oversight body in considering the privacy implications of the City's proposal and the following comments will substantiate that the City has done so at this stage of the process.

The following comments are provided in accordance with the Commissioner's powers and duties under s. 64.1(1)(d) and 64.1(1)(e) of the *Right to Information and Protection of Privacy Act*. Please note that this Office is unable to provide an endorsement or approval of the City's proposal or to offer a definitive statement as to whether the City's proposal is compliant with the governing privacy legislation. That being said, we are pleased to provide the following comments on access to information and privacy implications based on the information that has been provided to this Office to date.

The City's proposal is still at the conceptual stage, which is why the City engaged the services of an external consultant with considerable privacy expertise to conduct a Preliminary Privacy Impact Assessment. The goal of a PPIA is to identify appropriate privacy considerations and requirements at the early stages of a project, as it is far easier to address these at the outset rather than trying to do so retroactively after problems arise.

Smart cities initiatives and privacy considerations

Innovation and technology promise great things and there are a multitude of benefits for municipalities in using data and technology to improve the services it provides to its citizens as well as its own internal operations. As all are no doubt aware, technological innovations continue to advance much more quickly than common understandings of how these things work and it can be a challenge to identify and implement appropriate safeguards to ensure that personal information is protected and that privacy rights are respected. This often requires substantive work at the outset of a project, but it must be considered as an investment in and commitment to the project's overall success. Experience shows that it is often simpler to critically assess a project at the outset with a view to anticipate problems before they arise rather than retrofit measures after the fact.

One of the primary challenges facing smart cities initiatives is ensuring that they include effective management of privacy

ACCESS TO INFORMATION AND PRIVACY
ACCÈS À L'INFORMATION ET PROTECTION DE LA VIE PRIVÉE
230-65 rue Regent St., Fredericton, NB E3B 7H8
☎ 506.453.5965/877.755.2811 📠 506.453.5963
✉ access.info.privacy@gnb.ca
✉ acces.info.vieprivée@gnb.ca
www.oic-bci.ca

CONFLICT OF INTEREST AND LOBBYIST REGISTRY
CONFLIT D'INTÉRÊTS ET REGISTRE DES LOBBYISTES
Maison Edgcombe House, 736 rue King St., Fredericton, NB E3B 1G2
☎ 506.457.7890 📠 506.444.5224
✉ oic@gnb.ca
www.oic-bci.ca



risks. While this can be particularly challenging when innovative technologies are involved, the overarching privacy considerations always remain the same, which include:

- Clearly defining the project's goals and objectives at the outset;
- Ensuring that privacy requirements and considerations are set out in easy to understand policies and practices and that everyone involved understands them;
- Ensuring that data sharing agreements and contracts with external parties clearly set out privacy, security, and accountability requirements;
- Minimizing the amount of personal information collected, used, and disclosed to only what is necessary to accomplish the purpose;
- Guarding against re-identification of de-identified and aggregate data;
- Considering less privacy-invasive ways to achieve these goals and objectives;
- Ensuring adequate protections are in place to guard against cyberattacks, including system/server monitoring and reporting and alerts for security or privacy issues.

Overall project

The City's proposal at this point is still at the conceptual stage, and for this reason, many of the details as to how exactly things will work are yet to be determined. While this Office will have many additional questions should the proposal move forward, at this point, the key is to ensure that the City has identified all of the appropriate privacy concerns and that it has a general plan on how these will be addressed.

Seeking an independent consultant to conduct a PPIA was an excellent starting point. It appears from my review that the consultant has used all of the information available to him at this stage to pull together a comprehensive overview of the proposal and each of the five projects and to identify the privacy considerations that will need to be addressed should the proposal move forward.

The comments that follow will clarify certain points raised in the PPIA as well as additional considerations that this Office would like to bring to the City's attention. For ease of reference, I have attempted to keep these comments in the same order as the consultant's recommendations as set out by each of the ten CSA privacy principles.

Jurisdictional issues

As noted in the PPIA, the overall project extends beyond the City, as the City intends to partner with a number of organizations in different capacities, including private sector organizations, not-for-profit organizations that serve the community, and other public sector entities.

At all times, the City's handling of the personal information involved in all aspects of the proposal, should it go ahead, will be governed by the *Right to Information and Protection of Privacy Act* as it is a public body as defined in s. 1, regardless of what other legislative scheme others involved with the various aspects of the proposal may fall under.

Identifying purpose

As a starting point, while I understand that the proposal is still at a conceptual stage, the overall description of the project, and particularly the descriptions of Digital Fredericton and the Real-Time Census/Smart City Dashboard, is somewhat vague and it is difficult to understand what exactly the City is proposing to do and how this will be accomplished. For the other three projects (Doorable, the Non-Profit Data Collaboration, and Road Home Digital Platform Projects), the scope and intent for each is more clearly defined and easier to understand, although again, it is not entirely clear how these three projects will interact with the Real-Time Census/Smart City Dashboard.



From my understanding, the Dashboard appears to be the central component of the overall project, with information feeding into the Dashboard from various sources (the City, members of the public, the Doorable app, and not-for-profit agencies through NB-IRDT and possibly the federal database HIFIS4), and the Dashboard will provide access to certain information to certain individuals and organizations, depending on who they are and what information they would be authorized to access. It is not yet clear exactly how the Dashboard will be structured and how access to the different types of information that it will contain will be managed, but these are considerations that will obviously need to be addressed should the proposal move forward.

Governance and Privacy Framework

As the consultant noted in the PPIA, the key accountability measures on privacy issues are setting up an effective governance structure and establishing an overarching privacy framework. The City has a proposed governance structure in mind and the external consultant has identified in the PPIA all key documents that form part of a robust privacy framework, including data sharing agreements, privacy and security protocols, record retention policies, and so on. These will be developed and finalized should the City's proposal move forward, and in my view, the consultant has identified all of the relevant considerations on these points.

Should the proposal move forward, we would strongly encourage that a person be specifically designated to address privacy complaints from the general public and complaints filed with this Office. It appears from the information provided that each component of the proposal would have its own designated person for this purpose. It will be imperative that each of the designated individuals in this capacity be given clear guidance and direction on what this role will entail. Having a specifically designated privacy person is particularly important when different organizations are involved in a project or program to ensure accountability internally and to the public.

Consent

Informed consent means the individual is aware of what will happen with his or her information, agrees to this, and is able to withdraw his/her consent at any time. The documentation provided indicates that the collection, use, and disclosure of personal information in the context of the proposal will be done on a consent basis, although there is some question as to whether consent can be said to be present for some personal information that is intended to be used for the Non-Profit Data Collaboration project and the Road Home (this will be discussed below).

As the intent is to proceed on a consent basis, the City recognizes that it will need to develop a meaningful and user-friendly consent form. The consultant provided guidance on what should be included in a consent form in this context, which is found in Appendix A. Having reviewed this, we have the following comments on this point:

- A public body's authority to collect personal information is found in s. 37 (not s. 43) of the Act;
- When a public body is collecting personal information directly from the individual, s. 38(2) requires the public body to inform the individual of the purpose of the collection, the legal authority for the collection, and the title, business address and telephone number of an officer or employee of the public body who can answer the individual's questions about the collection. The consent from guidance contains the first two items, but not the third (contact info for someone who can answer questions);
- The consent form should also allow the individual to indicate whether he/she consents to the disclosure of his/her information for a specific purpose;
- The draft consent form indicates that consent will be reviewed annually. This is a good practice and the process for reviewing consent should form part of the overall privacy policy documents.

A further factor to consider is if individuals no longer consent to participate, it should be easy for them to opt-out and they should also be provided the option to have their personal information deleted.



There is some question as to whether consent can be said to exist for the use of not-for-profit organizations' client information for a different purpose (research) than for which it was originally collected (provision of services to the individual). While the question of consent can easily be addressed on an on-going basis in the future by having the service provider specifically obtain its clients' consent for disclosure for this purpose, it is less clear that consent can be imputed for previous clients and existing client information, particularly in the absence of signed consent forms for some individuals. The PPIA offers the opinion that research would be "a use consistent with the original purpose of collection" (p. 25); however, the clients of the service provider may not necessarily be of the same opinion. In my view, the not-for-profit organizations may want to take steps to inform their respective clientele and update their practice documents and consent forms. If participation is voluntary, clients should have the option to choose not to have their information included in this initiative.

Aggregate data

The PPIA indicates that some of the information involved in the overall project will be aggregate data, which we understand to mean information that is personal in nature but with personal identifiers removed. Aggregate data is intended to be provided to the Dashboard from Appdigenous for the Doorable Project, non-profit organizations via the Department of Health and the NB Institute for Research, Data, and Training (IRDT), and possibly homeless serving agencies via the Statistics Canada HIFIS4 database.

While aggregate data is often assumed to be de-identified and thus not personal information, careful attention needs to be paid to how the data is aggregated. Simply removing clearly identifying fields of personal information such as names, addresses, and the like may not be sufficient to ensure that it is truly de-identified. This should be assessed for each component of the proposal that will be sharing aggregate information, and depending on how the aggregate data will be used and to whom it will be disclosed, this consideration should include an assessment of whether the data could be used in combination with other publicly available information to potentially re-identify any of the individuals in question.

Limiting Collection, Use, and Disclosure

Even where a public body is authorized to collect, use, and/or disclose personal information under the *Act*, it must be limited to the minimum amount necessary to accomplish the purpose in question. As an example, if a public body collects more personal information than is necessary for a particular purpose, it remains responsible for protecting all of that personal information, including guarding it against privacy breaches and possible unauthorized further uses and/or disclosures.

It is important to note that the term "privacy breach" is defined in s. 4.2(1) of Regulation 2010-111 as "any incident of unauthorized access, use, disclosure or disposal of personal information in the custody of or under the control of a public body." According to this definition, using or disclosing more personal information than is necessary to accomplish the purpose is considered a privacy breach under the *Act*.

To assist on this point, the consultant prepared a data element template, which is found in Appendix B. The template calls for each personal data element to be listed, along with the purpose of its collection/use/disclosure, and why that data element is necessary for the project. This is a good exercise to be conducted at the outset of a project (and any project or program that involves personal information, for that matter), as it will prompt the question "do we really need this kind of personal information to accomplish what we are trying to do?" Documenting this thought process at the outset will be helpful to identify what exact personal information is necessary for the project in question, and can serve as a good accountability tool in the event that questions are raised later about the collection/use/disclosure of personal information in this context.

Our only comment on this point is that the template could include separate columns for collection, use, and disclosure

as some data elements may merit different considerations for each.

Safeguards

Section 48.1 of the Act requires public bodies to establish information practices and to make reasonable security arrangements against unauthorized access, use, disclosure or disposal, and further requirements are set out in s. 4.2 of Regulation 2010-111. As these requirements recently came into effect (as of April 1, 2018), the relevant provisions of the Regulation are reproduced below for ease of reference.

Section 4.2(2) sets out the internal security arrangements that a public body must have in place with respect to personal information in its custody or under its control:

- (a) Identify
 - (i) the names or categories of its officers, directors, employees or agents who are authorized to access the personal information,
 - (ii) the categories of personal information to which those persons or any category of persons have access,
 - (iii) the types of access permitted to the personal information by those persons or any category of those persons;
- (b) only allow access to the personal information to persons or categories of persons authorized under paragraph (a);
- (c) when responding to requests for disclosure under the Act, ensure that the request contains sufficient detail to uniquely identify the individual to whom the information relates;
- (d) provide for the following procedures, appropriate in each case for the level of risk of unauthorized access, use, disclosure or disposal of the personal information and the degree of harm that might arise from any unauthorized access, use, disclosure or disposal of the personal information:
 - (i) with respect to a person seeking access to personal information, verifying the identity of the person seeking access, the categories of personal information to which the person has access and the type of access permitted under paragraph (a);
 - (ii) recording and monitoring access to the personal information; and
 - (iii) protecting the personal information while the information is stored or being transferred.

Section 4.2(3) of the Regulation also requires that a public body's officers, directors, employees and agents comply with the required security arrangements and that the effectiveness of these security arrangements be periodically tested and evaluated.

Again, as the project is at a conceptual stage, it is difficult for this Office to provide input beyond general safeguards that must be in place for projects of this nature. Having reviewed the PPIA, particularly the discussion on safeguards at pp. 48-55, it appears that the consultant has identified the appropriate physical and administrative safeguards that would need to be addressed and implemented should the proposal move forward.

As noted in the PPIA, some of these safeguards can be readily addressed through a strong governance structure and privacy framework documents, while the technical safeguards will need to be developed as more details become available about the actual structure of the Dashboard.

It goes without saying that the project as a whole will encompass a large amount of personal information of residents of the City and robust technical safeguards will need to be implemented to protect the data from both external threats such as hackers as well as from internal threats such as unauthorized access by authenticated users. In addition to firewalls



and general server security, access and audit controls should also be built into the system to enable a review of who accessed what specific personal information and when.

It appears from p. 17 of the PPIA that the intent is to create sub-sets of information within the Dashboard, with the intent to keep the individual components somewhat separate and only accessible by appropriate parties:

All personal information collected by the five projects will be used by each project and will remain securely within the cloud platform/data base of the individual project and will not be disclosed to any other organization without the express consent of the individual whose personal information it is.

As it appears that different kinds of information are to be made available to different kinds of users, depending on their role/purpose in accessing the Dashboard, appropriate technical safeguards would need to be built into the system to ensure that access is only permitted to access the personal information that a particular user is authorized to see.

Should the proposal move forward, it will be incumbent on the City to conduct a final privacy impact assessment before launching the project as well as have an independent organization conduct a threat risk assessment (TRA) on all electronic platforms.

Privacy breaches and mandatory notification

Part of the recent amendments also now require public bodies to notify affected individuals as well as this Office in the event of a privacy breach where the circumstances raise the risk of significant harm to the affected individuals. To assist public bodies with this, our Office has developed a Privacy Breach Reporting Form, a copy of which is attached for your reference (please note that the form is also available on our website).

Public bodies are now also required to take the following internal measures with respect to privacy breaches under s. 4.2(4) of the Regulation:

- (a) investigate every reported privacy breach, actual or suspected;
- (b) maintain a registry of every actual privacy breach reported and any corrective measure taken in relation to the privacy breach to diminish the likelihood of a similar occurrence.

Given these new requirements, the above should be reflected in the privacy framework for the project.

Openness and keeping the public informed

As discussed at our meeting last month, it is imperative that the City keep the public informed as developments progress on what the City intends to do with personal information as part of the proposal and, in general terms, how personal information will be protected. Information about the governance structure as well as policy and guidance documents should be made publicly available where appropriate as they are developed and finalized.

Individuals should be able to easily find out who they can contact if they have questions or concerns about the project as a whole and how their information is being handled, how they can access their own personal information, and how they

can file a privacy complaint if they think their information has been mishandled. Transparency about the project and how personal information will be handled will go a long way towards helping the public understand what is happening and foster a sense of trust that the City is taking its obligations with respect to its citizens' personal information seriously.

Access rights to one's own personal information

As noted in the PPIA, s. 7(2) of the *Right to Information and Protection of Privacy Act* gives individuals the right to request



and receive their own personal information held by public bodies. This means that individuals will have the right to request and receive their own personal information, and as the PPIA notes, details about how individuals can exercise their right to their own information should be readily available and easily accessible.

Big picture considerations

While privacy considerations in the context of large-scale data projects are often primarily focused on getting the smaller details addressed, it is also important not to lose sight of the big picture privacy concerns.

The biggest concern raised by the concept of a "real-time census" of City residents, particularly in compiling profiles for various segments of City residents, is the danger that the personal information collected could be used as a means of surveillance of certain groups such as vulnerable communities or the population as a whole. While we often speak of privacy in the context of individual privacy rights, large-scale databases of personal information also raise concerns about group privacy and the potential for public bodies to use data to encourage or influence behavioural modification.

Projects of this nature also raise concerns that the personal information gathered could easily be used or disclosed for a purpose that could be seen as helpful or really useful, but well beyond the purpose for which it was originally collected (sometimes referred to as "function creep"). Technology permits this to occur with no way for the individuals involved to know that this was contemplated or actually occurred. The solution to this challenge is to ensure that strong accountability mechanisms are in place, that proper assessments are done before using or disclosing personal information for a secondary or unrelated purposes, and keeping the public well informed on what is happening with the personal information involved in the project.

In conclusion, I hope the above comments are helpful. If you have any questions or concerns or wish to discuss, please do not hesitate to contact our Office.

Sincerely,

Kara Patterson
Senior Legal Counsel

Encl.: Privacy Breach Reporting Form

From: SC / VI (INFC)
Sent: March 4, 2019 4:20 PM
To: Bell, Adam
Subject: RE: Final Proposal - City of Fredericton and Saint Mary's First Nation 6 of 6

Hello,

Thank you for your submission. Please consider this email as acknowledgement of receipt. We will follow up with you to confirm that your final proposal is ready for evaluation.

Thank you.

Smart Cities Challenge Team

Infrastructure Canada
infc.sc-vi.infc@canada.ca

Bonjour,

Merci d'avoir déposé votre proposition définitive. Veuillez considérer ce courriel comme accusé de réception. Nous ferons un suivi avec vous pour confirmer que votre proposition définitive est prête pour l'évaluation

Merci.

L'Équipe du Défi des villes intelligentes

Infrastructure Canada
infc.sc-vi.infc@canada.ca

From: Bell, Adam [mailto:Adam.Bell@Fredericton.ca]
Sent: March 4, 2019 4:03 PM
To: SC / VI (INFC) <infc.sc-vi.infc@canada.ca>
Subject: Final Proposal - City of Fredericton and Saint Mary's First Nation 6 of 6

Please find attached City of Fredericton and Saint Mary's First Nation long text descriptions for accessibility requirements.

This email is six of six that includes the following

1. Final proposal
2. Letters of Support
3. Finalist Video link to download video
4. Preliminary Privacy Impact Assessment
5. Response from the Office of the Integrity Commissioner
6. **Long text descriptions for accessibility requirements and transcripts**

Point of Contact:

Adam Bell [REDACTED]
Assistant Director – Finance, Innovation & Technology
City of Fredericton
335 Queen St.
Fredericton NB, E3B 1B1
Phone: (506) 460-2182
Cell: (506) 478-2234

"Partnering with others to support our organization in making Fredericton the best place to live, work and play."

www.Fredericton.ca

Adam.Bell@Fredericton.ca



Transcripts

For videos related to the Fredericton/St. Mary's First Nation Smart Cities Challenge

Smart Cities Challenge Video Transcript

- Chief Polchies: Everyone matters. And the City of Fredericton and Saint Mary's First Nation is thinking outside the box so that we can develop and plan for today, tomorrow and the future.
- Mayor O'Brien: Not everybody has the same needs and wants. But everybody has needs and wants. And how do we connect each one of those groups to the services that they need so they can feel like they are part of the community?
- Valerie Kelly: The City of Fredericton wants to build a community where people feel like they're recognized, that they're connected to the things that matter most to them, and that they're able to experience an extraordinary City of Fredericton, all enabled by technology.
- Adam Bell: Overall what our goal in smart cities is to understand who are all the groups we're serving and what are their unique needs. And our approach now is to use deep research based on different segments within our society, understand what their challenges are. So, in this final submission phase, we've done ethnography, deep research on older adults. We used user centered design to bring people in and demonstrate how we would intend to build data and dashboards and technology that would suit their needs. We've followed a day in the life of folks in a wheelchair to understand how they get around, understand their unique needs. And then, from those deep insights, we're developing digital tools that serve those people.
- Laurie Guthrie: We have amazing people involved in this. Over 20 organizations, 42 people within the community, who have come together forming our five project teams. And people that are just really devoted to what we're trying to achieve.
- Adam Bell: Digital Fredericton really has three distinct elements. First, we recognize that cities need to modernize and upgrade their core systems that they use for day-to-day business. And we've done that and we invested several million dollars last year to bring those up to speed. The second phase are those E-government services. And that's where the understanding unique needs really comes into play because they need to be provided in a way that people can access them. The third phase of that is how we engage with the edge cases where people have very unique needs and challenges. Can we be innovative and connect those to our city systems? So the Doorable app is one. But we're also looking at apps for newcomers and apps for older adults that help them make social connections and feel more safe and secure in their community.

Resident : The accessible community was the one that drew my eye. It's the picture of the wheelchair, but the person's actually active.

Anna Robak: This will be a real hub of activity. It'll be a place that people know you can go to for information. They know that you can go there to connect. But really importantly, it lets you have a voice. So if you see that there's a problem in the city or you see there's something missing in terms of services and you want to step in and fill that gap, either as an entrepreneur or as a community member, this'll be the perfect platform for that.

Betty Daniels: We're averaging about 200 meals a day. We have a couple of hundred volunteers that we consider to be the backbone of Meals on Wheels.

Sandi Mackinnon: With this nonprofit data collaboration project, our nonprofit groups can share data and information among themselves. We have put in place all of the resources in order to enable our nonprofit community to be able to understand a little more about the data they're collecting and actually make such an impact in hundreds of people in our community that our nonprofit sector serves.

Betty Daniels: The data can help us to serve the community better.

Marchell C.: The Road Home is a roadmap on really tangible ways that the City of Fredericton could move forward with helping move people out of that cycle of homelessness in our city.

Warren Maddox: We deal with individuals on a continuum as opposed to sort of just providing a bed and four walls.

Marchell C.: The HIFIS 4 system will really allow this coordinated way to track and share information and share data that we've never been able to do before now.

Warren Maddox: It allows us to connect people to the other agencies that are providing critical programs and services, stabilizing them, giving them the mental health support or addiction support or financial support that they need to be able to move out into new, permanent houses, a place of their own.

Zack: People say that before they met me they didn't even realize how hard it is for somebody in a wheelchair to get around.

Melissa Lunney: The app is called Doorable. And it's an app that opens up the push to access accessible doors that you often see in public buildings. The button could be out of reach or in a really weird position that's kind of awkward to actually hit and enter the building. They don't really stay open for a long enough time. Getting that first door open will be a big deal, hopefully life changing, for the people that are going to be using it.

Chief Alan P.: This only makes sense that we collaborate in partnership on this initiative for all of the citizens of Fredericton.

Mayor Mike O.: People want to know that their city cares about their citizens and cares about them. This project's going to do that.

Non-Profit Data Collaboration Video Transcript (video linked in proposal)

Speaker:

Corporations and governments have been using data to make decisions and to set policy. Now, nonprofits are looking for the same benefits but are wondering about the pay off and have concerns about privacy and what looks like a lot of extra work. Where do we fit in?

In this short video we are going to break it down for you. In 2016, New Brunswick unveiled the provinces new open data policy and passed a legislation that will help provincial department share information. There has been a strong from government departments to share their data through the New Brunswick Institute for Research, Data and Training or IRDT. IRDT is one of the most secure data centers in Canada, and is subject to the policies and regulations of the university, as well as provincial and federal legislation. But how are they keeping the New Brunswick information safe?

Here is an overview of how it works.

The process of de-identifying data begins by agencies or government departments separating their data into two parts. The first part of the data may contain client information like names, addresses, and medicare numbers. The second part is the program data. This may include health records, employment records, social development records and so on, but contains no identifying information. Agencies and government departments assign a number called a linkage key to both sections of the data. The file that contains the identifying information, plus the linkage key is then sent to the department of health. By law, that department is able to receive this information. The second part, with only the program data and the linkage key is sent to the IRDT.

When the department of health receives the data, they remove all identifying information and assign the file with a designated institute ID number. Once that is done, they send the designated institute ID number, plus the linkage key to the IRDT administrator. Using the linkage key from the program file and the institute ID, the IRDT database administrator reattaches the two files. The main safety detail of this process is that no one, at any time, has access to all of the information. A researcher requesting data never sees the institute ID. The department of health, never sees the programmed data. And IRDT, never sees personal information like name, address, or medicare number.

IRDT is a highly secure facility and data cannot be accessed from outside their lab. Researchers who wish to access the data go through a rigorous application process to ensure every New Brunswick privacy is protected. So what does all these mean for nonprofit agencies?

IRDT is able to group datasets to a community level and share them on open data portals that will enable agencies to link to other available datasets like sensors, transportation, health, addiction, police, and so on. You can also access more detailed data through IRDT directly for program evaluation and research in collaboration with academics.

Sharing information is mutually beneficial as it allows for greater community impact, partnerships in new projects, outcome oriented funding applications, targeted programming and service delivery, ability to analyze data internally and in the context of community.

Moving forward, the IRDT data will play a key role in policy decisions made by our government. And nonprofits know it is important that their information is also included in these decisions. Being part of the data collaboration movement may feel challenging. It may not be straight forward for some and it may take a few years to work through all of the details, but the benefits can be great. These partners have come together to ensure our nonprofit agencies and the people they serve are included in and can benefit from this movement.

For more information please contact Greater Fredericton Social Innovation by email at info@socialinnovationFredericton.com or by calling 506-471-4374.

Doorable Video Transcript (video referred to in proposal and included on linked site)

- Melissa: My name is Melissa Lunney, I'm the founder of Appdigenous. Appdigenous is an app company and we make accessible apps.
- Zack: People say that before they met me, they didn't even realize how hard it is for somebody in a wheelchair to get around.
- Melissa: I noticed a lot of these things are kinda quick to change.
- Zack: Yes, there's been times when I don't know if I am going to make it in the 15 seconds or not.
- Melissa: Starting this project, I've learned of a lot of problems with accessible doors and buttons. The button could be out of reach or in a really weird position that's kind of awkward to actually hit and enter the building.
- They don't really stay open for a long enough time and that can actually injure someone if they get hit with it. Oftentimes, a building will only have one and you might have to go around the whole block to find that one accessible door.
- Getting that first door open will be a big deal. Hopefully life-changing for the people that are going to be using it.

Ethnography video (video referred to in proposal and included on linked site)

- Speaker 1: Da, da, da, da, da, da, da, da, da, da.
- Speaker 2: So,
- Speaker 1: Are you rolling now?
- Speaker 2: It's rolling.
- Speaker 1: Okay.
- Speaker 3: Nice walking trails.
- Speaker 1: And the people are wonderful people, so, beautiful. If I had one word, that would be it.
- Speaker 4: I like that it's a city of heart. I like that it's a community. I like that it seems to focus on all age groups.
- Speaker 5: Ambitious in its efforts to improve the quality of life of the people who live here.
- Speaker 6: I love singing. That's a vital part of me that keeps me active and young. And I love to volunteer and help out wherever I can.
- Speaker 7: I volunteer through cathedral church, and I come to King's place every day. [crosstalk 00:01:04] to use my phone [inaudible 00:01:05] and [inaudible 00:01:07] 50 cents. I need a ticket for [inaudible 00:01:14]. If I have about.
- Speaker 9: If we lost that ability to have our own vehicle, and we are in a bit of that situation right now, I think it would be more challenging.
- Speaker 10: Isolates me a little more. I don't do as much in a day or as much in a week as I used to when I had a car on my own.
- Speaker 11: Alright, that's all you can do because I don't know if the bus service will be that good.
- Speaker 12: Sometimes the bus drivers, they have a lift on their, a step up on the bus, it's also a hydraulic lift. And it can be lowered or lifted. They don't lower it enough for the seniors with walkers or [00:02:06] who can't get on and off.
- Speaker 14: It's nice to own a vehicle, shall we say? Switches [inaudible 00:02:15] from convenience of a vehicle. It's become, I guess it's almost like a lifestyle change, in a way. You kind of forget.
- Speaker 13: Freedom to move as life itself. And that has stuck with me ever since. If we pay attention to those simple needs in terms of the transportation, bus transportation

particularly, I think it makes the city a more successful place to be, a better place for people of any age to live.

Speaker 15: Whatever challenges we make I think it won't just benefit one [inaudible 00:02:59]. It will benefit all of us.

Long Text Table Descriptions

accompanying Fredericton and St. Mary's First Nation Smart Cities Challenge proposal

Note: Included are long text descriptions for complex tables as well as tables/charts that are represented in an image in the proposal. Simple tables that can be read by screen readers do not have a long text description provided. Corresponding page numbers are provided for ease of reference.

Page 35-37 – Human Resource Requirements

Digital Fredericton

- Role: Manager of Corporate Systems Renewal
 - Timeframe: Existing and ongoing
 - Responsibilities: Leads the Digital Fredericton Transformation, provides visionary leadership on renewal of corporate systems and alignment to the Digital Fredericton Vision. Manages the strategic partnerships and oversee the project implementation, milestones and Digital Fredericton outcomes.
- Role: City Subject Matter Experts
 - Timeframe: Secondments as required
 - Responsibilities: Provides subject matter expertise on City service delivery, and is seconded to agile project teams with technology partners to develop core systems and CRM projects throughout the project lifecycle.
- Role: Redeployed internal staff
 - Responsibilities: Staff time gained through efficiencies generated in modernizing core systems will be redeployed to digital customer relationship management.

Digital Community Hub

- Role: Digital Community Hub Coordinator
 - Timeframe: 5 years/ongoing
 - Responsibilities: Developing a structured five-year Digital Community Hub Plan in consultation with the Smart Cities Manager; data discovery and establishing/negotiating data sharing agreements, maintaining data sharing partnerships with organizations; liaising with Digital Fredericton team/St. Mary's ethnographer in terms of receiving ethnography inputs (segments & personas and insights); coordinating user-centred design as it relates to the Hub and feeding this into the design; developing data maintenance/renewal plan and long-term data strategy for future sustainability.
- Role: Data Analyst
 - Timeframe: 5 years/ongoing
 - Responsibilities: Modelling data; conducting analyses; liaising with data contacts with partner organizations to obtain aggregate data transfer; inputting data, facilitating the creation of required data; and assisting with data discovery.

- Role: Content Creator
 - Timeframe: 5 years/ongoing
 - Responsibilities: Creating content and assisting with the implementation of the Smart Cities marketing/communications plan includes: advertising/promotions for public engagement; hub/segment releases; social media and website content generation; building the brand, etc. This position also assists with the data entry and supports the overall Fredericton/St. Mary's Smart Cities Program.

Appdigenous

- Role: CEO
 - Timeframe: Ongoing
 - Responsibilities: Overall business leadership and development.
- Role: President
 - Timeframe: Ongoing
 - Responsibilities: Operational management of Doorable.
- Role: Technology lead
 - Timeframe: Ongoing
 - Responsibilities: Updating of Application(s). Leadership role with outside developers.
- Role: Finance Lead
 - Timeframe: Ongoing
 - Responsibilities: Management of Financial plan, budgets, payroll, billing and costing systems.
- Role: CRM
 - Timeframe: Ongoing
 - Responsibilities: Technical support for users, installers and subscribers, social media promotion.
- Role: Installers/Service
 - Timeframe: Ongoing
 - Responsibilities: To install Doorable hardware on subscribing facilities, capturing information required to populate the User App (maps, etc.). Service existing installs.
- Role: 6 Researchers
 - Timeframe: Jun-Aug/19
 - Responsibilities: To undertake the inventory project of all accessible doors in Fredericton and research strategy.
- Role: Data Entry Specialist
 - Timeframe: July 1-Sept/19
 - Responsibilities: To input data from inventory project.
- Role: Data Analytics Expert
 - Timeframe: Sept/19
 - Responsibilities: To analyze data from inventory project.

- Role: Research coordinator
 - Timeframe: May-Oct/19
 - Responsibilities: To coordinate research for inventory project.

Non-Profit

- Role: Project Manager
 - Resourced through GFSI.
- Role: Process Design Consultant
 - Resourced through GFSI.
- Role: Data Analyst
 - Resourced through NB-IRDT.

Road Home Digital Plan

- Resourced through participating agencies and in-kind partnerships.

Smart Cities Program Management

- Role: Smart Cities Manager
 - Timeframe: 5 years/ongoing
 - Responsibilities:
 - Managing the Digital Community Hub administration.
 - Liaising with project committees to facilitate the successful implementation of projects.
 - Managing budget oversight, and funding disbursements to the five projects.
 - Reporting to Infrastructure Canada.
 - Coordinating quarterly Fredericton Smart Cities Task Force meetings including report generation (quarterly progress reports, budget, issue management).
 - Managing strategic marketing and communications for the Smart Cities Program as it relates to Fredericton's brand. This includes the development of an integrated marketing communications plan (encompasses public awareness element/storytelling, leveraging partnerships with respect to marketing, public relations, refreshing GoFred brand, elevating Digital Fredericton brand, etc.).
 - Cultivating and fostering stakeholder relations/partnerships.
 - Managing Smart Cities Innovation Lab and liaising with potential and existing entrepreneurs as it relates to Smart Cities app development – connecting them with partners/staff and funding.
- Role: First Nations Lead
 - Timeframe: 5 years
 - Responsibilities:
 - Lead ethnographic research initiatives.
 - Oversee technology development and implementation.
 - Advocate and monitor OCAP principles for First Nations data.
 - Liaison for Digital Community Hub and NPO data teams.

- Role: Privacy Officer
 - Timeframe: 5 years
 - Sub-contract consultants for quarterly security review and ongoing development of policy and security practices.

Page 41 – Project Scheduling, Sequencing and Dependencies

Digital Fredericton

- Talent Development
 - Digital Talent Strategy (second half of 2019)
 - HR Scheduling (2020)
 - Talent & Performance Management (2021)
- Digital Core Systems
 - Customer Billing (2020)
 - Work Management (2021)

(Reinvest FTE capacity savings to CRM then to customer portal and digital relationships)

- Citizen Experience
 - Citizen Experience Strategy (second half of 2019)
 - CRM (2022)
 - Customer Portal (2023)
- Ethnography Research and Insights + Ideation, User-Centred Design and Prototypes
 - Older adults (2019)
 - Newcomers (first half of 2020)
 - First Nations (second half of 2020)
 - First Nations (first half of 2021)
 - Youth (second half of 2021)
 - Business (first half of 2022)
 - Segment G (second half of 2022)
 - Segment H (first half of 2023)
- Technology, Data and Application Development
 - Check-in app – for older adults (first half of 2020)
 - Hullo – for newcomers (second half of 2020)
 - Saint Mary's First Nations Tech A (first half of 2021)
 - Saint Mary's First Nations Tech B (second half of 2021)
 - Youth Tech (first half of 2022)
 - Business Tech (second half of 2022)
 - Segment G tech (first half of 2023)
 - Segment H tech (second half of 2023)

Digital Community Hub

- Initialize team (second half of 2019)
- Release #1 Accessible & Supportive (2020)
- Release #2 Cultural Connectedness (2021)
- Release #3 Economic Inclusion & Dashboard (2022)
- Release #4 NPO & Community Hubs & Community Profiles (2023)
- Integrated Interactive Inclusion (2024)

Road Home

- Core digital infrastructure (2019)
- Digital inclusion tools (2020)

Doorable

- Map accessible city (2019)
- Doorable deploy (early 2020)
- Develop online community (2021)
- Scale (2022)

Non-Profit Data Collaboration

- Initialize project (2019)
- Early adopters (2020)
- Practices, data and toolkit (2021)
- Data analysis and aggregation (2022)
- Collaboration and community data (2023)

Semi-annual milestones linking to performance measurement

- #1 (end of 2019)
- #2 (mid 2020)
- #3 (end of 2020)
- #4 (mid 2021)
- #5 (end of 2021)
- #6 (mid 2022)
- #7 (end of 2022)
- #8 (mid 2023)
- #9 (end of 2023)
- Final (mid 2024)

Page 43 – Activities, Outputs and Links to Outcomes and Strategic Vision

Vision

- Collaboration to create a welcoming, accessible, supportive community
- Recognizing what is important to individuals
- Connecting them to what matters most, empowering residents with personalized digital data and tools

Long-Term Outcomes

- More effective, efficient & targeted services that are more appropriate to address the need
- Detailed community profile with richly defined segments and needs
- Personalized digital inclusion

Immediate & Intermediate Outcomes

- Streamlined case management and more accurate assessment of individual client needs
- More accurate assessment of client needs/services at a community level
- Recognition of service overlaps/gaps and identify areas of improvement
- Reduce client need to re-tell their story and time to access services
- Increased service coordination between like-minded agencies
- Enable effective analysis and insight driven decision making
- Improve efficiencies and redirect freed-up staff to customer facing roles
- Better insight on customer priorities and needs
- New segment-specific digital inclusion tools that address a core need and contribute to data
- Insightful, curated data from multiple community sources
- Easier for residents to access services/ info
- Increase citizen engagement /participatory democracy
- More insight into barriers and challenges
- Improved accessibility/ barrier reduction through connected technology

Key Activities & Outputs

- Road Home Digital
 - Implement HIFIS4 among homeless serving agencies
 - Modernize shelter and community digital infrastructure
 - Digital resources for people experiencing homelessness
- NPO Data Collaboration
 - Work with NPOs to create data standards and sharing agreements
 - De-identify, transfer, link data through NB-IRDT and connect aggregate data to Digital Community Hub
 - Run custom analysis with in-house and community data
 - Build capacity/expand project reach

- Digital Fredericton
 - Improving core operational systems
 - Implement core HR/Talent strategies and systems
 - Customer facing strategies and systems (citizen experience strategy, CRM, self-service citizen portal)
 - Enable connected community
- Digital Community Hub
 - Combine datasets and digital resources from diverse community sources
 - Create personalized inclusion portal
 - Create hub for communities of interest for data/info sharing
 - Establish/measure smart city indicators
- Doorable
 - Map accessible city
 - Deploy hardware and software to wirelessly open doors
 - Build out app to allow communication about accessibility barriers
 - Build data through interactions between users and infrastructure

Page 44-46 – Measuring Outcomes and Performance Indicators

Page 44

Strategic Theme: Collaboration to create a welcoming, accessible, supportive community – Logic Model and Balanced Scorecard

- Long-term Outcome: **Services Address Needs**
 - Objective: Increase inclusion by providing targeted services that address needs, working in an end to end environment that puts citizen engagement first
 - Measure: Increased percentage of citizens who are satisfied with the supports and services to help them participate fully in the community
 - Target: 95%
 - Baseline: TBD
 - Data Source: Citizen Attitude Survey; Digital Community Hub
- Immediate and Intermediate Outcome: **Increased Collaboration**
 - Objective: Increased service coordination between like-minded agencies
 - Measure: Number of new service collaborations between NPOs
 - Target: 10
 - Baseline: TBD

- Data Source: Greater Fredericton Social Innovation (GFSI) - self report
- Objective: Recognition of service overlaps/gaps & identify areas of improvement
 - Measure: Agencies reporting use of data to improve services
 - Target: 10
 - Baseline: TBD
 - Data Source: GFSI - self report
- Immediate and Intermediate Outcome: **Streamlined Service Delivery**
 - Objective: Streamlined case management
 - Measure: Clients connected to appropriate services quickly
 - Target: TBD
 - Baseline: Unknown
 - Data Source: Shelters
 - Measure: Reduction in duplicate files
 - Target: 0
 - Baseline: Unknown
 - Data Source: HIFIS4
 - Objective: More accurate assessment of needs using shared data
 - Measure: Granting agencies using data/outcomes as a criteria for funds
 - Target: 2
 - Baseline: 0
 - Data Source: United Way and Fredericton Community Foundation
 - Objective: Faster more convenient City services
 - Measure: Increase in customer satisfaction
 - Target: 40%
 - Baseline: -
 - Data Source: Citizen Attitude Survey
- Project Activities and Outputs: **Modernize Core Systems**
 - Objective: Implement HIFIS4 Core
 - Measure: Number of agencies
 - Target: 9
 - Baseline: 0

- Data Source: Homeless agencies
- Objective: Modernize core City systems for efficient service delivery and operations
 - Measure: Reallocating talent from admin to customer service
 - Target: 4000 hrs
 - Baseline: 0
 - Data Source: Lean 6 Sigma process reviews
 - Measure: Realized operational efficiencies
 - Target: 38%
 - Baseline: 0
 - Data Source: Lean 6 Sigma process reviews
- Objective: Develop core data tools for NPOs
 - Measure: Number of orgs who contribute and share data
 - Target: 40
 - Baseline: 0
 - Data Source: GFSI - self report

Page 45

Strategic Theme: Recognizing what is important to individuals – Logic Model and Balanced Scorecard

- Long-term Outcome: **Detailed Community Profile**
 - Objective: Develop a detailed community profile with richly defined segments & needs
 - Measure: % of population captured in a one or more personas
 - Target: 100%
 - Baseline: 0
 - Data Source: Ethnographic Research compared to Stats Can data
- Immediate and Intermediate Outcome: **Develop Rich Insights**
 - Objective: Develop rich insights into community needs through thorough analysis of diverse data inputs connected technology and people
 - Measure: Number of issues that have comprehensive analysis using community input
 - Target: 14

- Baseline: Unknown
- Data Source: Digital Community Hub Data Analyst
- Immediate and Intermediate Outcome: **Strong Community Voice**
 - Objective: High-level ongoing engagement from community organizations, interest groups and individuals contributing to caused based hubs, identifying issues, and voicing perspectives
 - Measure: Number of organizations contributing data and participating in cause-based hubs
 - Target: 10
 - Baseline: 0
 - Data Source: Digital Community Hub Coordinator
- Project Activities and Outputs: **Diverse Collection of Digital Input**
 - Objective: ID segments and develop insights, and ideas through ethnography
 - Measure: # of detailed segment aspirations and experience analysis
 - Target: 8
 - Baseline: 0
 - Data Source: Ethnographic Researchers Completed Reports
 - Measure: # of personas
 - Target: 24
 - Baseline: 0
 - Data Source: Ethnographic Researchers Completed Reports
 - Measure: # moments that matter
 - Target: 100
 - Baseline: 0
 - Data Source: Ethnographic Researchers Completed Reports
 - Objective: Develop cause-based hubs for diverse community issues
 - Measure: # of cause-based hubs created
 - Target: 8
 - Baseline: 0
 - Data Source: Digital Community Hub Coordinator
 - Objective: Connect data from connected community applications to drive insights
 - Measure: # of segment-specific applications providing data to the dashboard

- Target: 8
- Baseline: 0
- Data Source: Digital Community Hub Coordinator
- Objective: Drive insights from CRM/311
 - Measure: Annual analysis of top 5 issues
 - Target: 25
 - Baseline: 0
 - Data Source: Service Fredericton

Page 46

Strategic Theme: Connecting residents to what matters, empowering them with personalized digital tools – Logic Model and Balanced Scorecard

- Long-term Outcomes: **Personalized Digital Inclusion**
 - Objective: Increased inclusion through uptake of personalized digital inclusion tools and citizen portals
 - Measure: % of population using personalized digital inclusion tools
 - Target: 10%
 - Baseline: unknown
 - Data Source: Sum of DCH users, CRM users, and users of connected community apps
- Immediate and Intermediate Outcome: **Segment Specific Tools**
 - Objective: Create self service tools that are intuitive and help people find resources relevant to their needs and reduce barriers
 - Measure: Customers who rate the digital tools as highly satisfactory in connecting to what matters and reducing barriers
 - Target: 75%
 - Baseline: 0
 - Data Source: Develop customer feedback areas within tools
 - Measure: # of tailored tools per segment
 - Target: 1
 - Baseline: -
 - Data Source: Smart City Manager
- Immediate and Intermediate Outcome: **Citizen Co-creation**
 - Objective: Incorporate user-centre design iterations to improve and deploy technology that reduces barriers and improves access

- Measure: Customers who provide on-going feedback on the digital tools (CRM portal, connected apps and DCH)
 - Target: 10%
 - Baseline: 0
 - Data Source: Develop customer feedback areas within tools
 - Measure: End user participation in user-centered design workshops
 - Target: 300
 - Baseline: 0
 - Data Source: User-centred design consultants' reporting
 - Measure: # of user-centered design iterations
 - Target: >2/app
 - Baseline: 0
 - Data Source: User-centred design consultants' reporting
- Project Activities and Outputs: **Connect Data, Ideas and Technology**
 - Objective: Deploy technologies for user adoption
 - Measure: User uptake on each new tool
 - Target: 8%
 - Baseline: 0
 - Data Source: Application userbase
 - Measure: Market penetration for Doorable
 - Target: 50%
 - Baseline: 0.7%
 - Data Source: Doorable
 - Objective: Improve basic digital access
 - Measure: # of agencies and public spaces with digital access for clients
 - Target: 50
 - Baseline: 15
 - Data Source: Fred-e Zone reporting
 - Objective: Create personalized inclusion spaces
 - Measure: Number of unique visitors to Digital Community Hub and CRM portals
 - Target: 5000
 - Baseline: 0
 - Data Source: Develop analytics on Digital Community Hub userbase

- Objective: Create rich data sets and resources for users and innovators
 - Measure: # of datasets in the hub
 - Target: TBD
 - Baseline: TBD
 - Data Source: Digital Community Hub Coordinator reporting
 - Measure: # of services and programs listed/linked in the hub
 - Target: TBD
 - Baseline: TBD
 - Data Source: Digital Community Hub Coordinator reporting

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Progress Timelines, Deliverables, Milestones and Payment Schedule

Milestone Payment #1 – December 2019 – \$1,925,000

- Deliverable Milestones
 - Complete Citizen Experience Strategy
 - Complete Digital Talent Strategy
 - Community Digital Hub team established
 - NPO team operational
 - Ethnographic research older adults
 - Map of the Accessible City
 - Doorable initial deployment
 - Road Home Core Infrastructure Installed
- Performance Milestones
 - Empathy based personas (3/24)
 - Insightful moments that matter (12/100)
 - Segment aspirations and experience analysis (1/8)
 - Number of installations of Doorable hardware (200/200)
 - Number of agencies onboarded to HIFIS4 (5/9)
 - Number of users of digital access at homeless agencies per month (100)

Milestone Payment #2 – June 2020 – \$620,000

- Deliverable Milestones
 - Complete Newcomer ethnography
 - Check-in companion app V1

- Technology inclusion tools for homelessness
- Doorable deployment & dev
- Performance Milestones
 - Empathy based personas (6/24)
 - Insightful moments that matter (24/100)
 - Segment aspirations and experience analysis (2/8)
 - Number of user centered design iterations (2)
 - User uptake as a percentage of segment (8%)
 - Number of agencies on HIFIS4 (8/9)

Milestone Payment #3 – December 2020 – \$ 2,700,000

- Deliverable Milestones
 - Implemented core Customer Billing
 - Implement core HR Scheduling
 - Complete 1 First Nations ethnography
 - Develop Newcomer technology V1
 - 10 NPOs on-board data project
- Performance Milestones
 - % of customers transitioned to self-serve online accounts (50%)
 - Number of FTE hours efficiency gained (2000)
 - Empathy based personas (9/24)
 - Insightful moments that matter (36/100)
 - Segment aspirations and experience analysis (3/8)
 - Number of user centered design iterations (2)
 - User uptake as a percentage of segment (8%)
 - Number of user-centered design iterations (2)
 - First 10 out of 40 NPOs (10/40)
 - Number of cause based hubs created (3/8)
 - Number of monthly contributors to the DCH (100/500)
 - Number of unique visitors to DCH & CRM portals (500/5000)
 - Market penetration of Doorable on public facilities (50%)

Milestone Payment #4 – June 2021 – \$200,000

- Deliverable Milestones
 - Complete 2nd First Nations ethnography
 - Develop First Nations technology (a)
- Performance Milestones
 - Empathy based persona (12/24)
 - Insightful moments that matter (50/100)
 - Segment aspirations and experience analysis (4/8)
 - Number of user centered design iterations (2)
 - User uptake as a percentage of segment (8%)
 - 9 agencies on HIFIS (9/9)
 - Reduction in number of duplicate files (TBD)

- Speed to connect clients to appropriate services (TBD)

Milestone Payment #5 – December 2021 – \$ 1,695,000

- Deliverable Milestones
 - Implement Talent & Performance Management
 - Implement Work Management & Field Service
 - Complete ethnography for youth segment
 - Develop First Nations technology (b)
 - Create Doorable online community
 - Create NPO data and practices toolkit
 - DCH Release #2 Cultural Connectedness
- Performance Milestones
 - Increase in customer satisfaction with billing (40% increase)
 - Number of FTE hours efficiency gained (6000)
 - Empathy based persona (15/24)
 - Insightful moments that matter (62/100)
 - Segment aspirations and experience analysis (5/8)
 - Number of user centered design iterations (2)
 - User uptake as a percentage of segment (8%)
 - Number of users on the Doorable application (2000)
 - Next 10 of 40 NPOs (20/40)
 - Number of caused based hubs created (5/8)
 - Number of monthly contributors to the DCH (200/500)
 - Number of issues that have comprehensive analysis using community input (4/14)
 - Number of unique visitors to DCH & CRM portals (1000/5000)

Milestone Payment #6 – June 2022 – \$195,000

- Deliverable Milestones
 - Complete ethnography business
 - Develop technology for youth
- Performance Milestones
 - Empathy based persona (18/24)
 - Insightful moments that matter (75/100)
 - Segment aspirations and experience analysis (6/8)
 - Number of user centered design iterations (2)
 - User uptake as a percentage of segment (8%)

Milestone Payment #7 – December 2022 – \$1,275,000

- Deliverable Milestones
 - Implement CRM
 - Complete ethnography for segment G
 - Develop business technology
 - NPO Data analysis and aggregation
 - Doorable scale business

- DCH Release #3 Economic Inclusion and dashboard
- Performance Milestones
 - First 2000 hours reallocated to customer relationships (2000/4000)
 - Analysis of top CRM issues in 311 data (10/25)
 - Segment aspirations and experience analysis (7/8)
 - Empathy based persona (21/24)
 - Insightful moments that matter (87/100)
 - Number of visitors to the Digital Community Hub and CRM portals (5000/5000)
 - Number of user centered design iterations (2)
 - User uptake as a percentage of segment (8%)
 - Next 10 NPOs on board (30/40)
 - NPO testimonial reporting using data effectively (10)
 - Number of caused based hubs created (7/8)
 - Number of issues that have comprehensive analysis using community input (9/14)
 - Number of monthly contributors to the DCH (300/500)
 - Number of unique visitors to DCH & CRM portals (2000/5000)

Milestone Payment #8 – June 2023 – \$197,000

- Deliverable Milestones
 - Complete ethnography for segment H
 - Develop technology for segment G
- Performance Milestones
 - Empathy based persona (24/24)
 - Insightful moments that matter (100/100)
 - Segment aspirations and experience analysis (8/8)
 - Number of segment specific tools deployed (8/8)
 - Users who rate the digital tools as highly satisfactory in connecting them to what matters (75%)
 - User uptake as a percentage of segment (8%)

Milestone Payment #9 – December 2023 – \$1,190,000

- Deliverable Milestones
 - Implement Customer Portal
 - Develop technology for segment H
 - NPO data collaboration & community data
 - DCH Release # 4 NPO Community Hub & Community Profile
- Performance Milestones
 - Next 2000 FTE hours reallocated to customer relationship (4000/4000)
 - Analysis of top CRM issues (25/25)
 - Number of user centered design iterations (2)
 - User uptake as a percentage of segment (8%)
 - Next 10 NPOs on board (40/40)

- Funding grants supported by data using outcomes as a criteria (2)
- Number of organizations contributing data to the DCH (10)
- Number of service collaborations between NPOS (10)
- Number of cause based hubs created (8/8)
- Number of monthly contributors to the DCH (400/500)
- Number of issues that have comprehensive analysis using community input (14/14)
- Diversity of inputs used in analysis per issue (organizational input, individual input, ethnography, connected technology) (<3)
- Number of unique visitors to DCH & CRM portals (5000/5000)

Milestone Payment Final – June 2024 – \$3,000

- Deliverable Milestones
 - Interactive Integrated Personalized Inclusion
- Performance Milestones
 - Number of monthly contributors to the DCH (500/500)
 - % of residents who are satisfied with services to help them participate fully (95%)
 - % of residents captured in 1 or more empathy based personas (100%)
 - % of population using personalized digital inclusion tools, DCH and Customer portal (10%)

Page 56 – Interoperable Open Architecture for a Smart City

Layer: Intelligent Adaptive User Applications

- Object: Enterprise core applications
 - Technology: Oracle ERP, Human Capital, and Work Management; MS Dynamics 365 CRM; HIFIS4; ESRI Geographic IS
- Object: Digital Community Hub
 - Technology: ESRI ArcGIS Community Hub
- Object: Connected community applications
 - Technology: Doorable; LiveKool Check-In App; Hullo and future development

Layer: Smart Algorithms and Microservices

- Object: Serverless computing
 - Technology: Amazon S3, AWS Lambda
- Object: Identity management
 - Technology: AD B2C, Cognito
- Object: Access and authentication
 - Technology: MS ADFS
- Object: Recommendation engines
 - Technology: Amazon Personalize
- Object: Chatbot and voice recognition
 - Technology: AWS Lex
- Object: Machine learning

- Technology: SageMaker on AWS
- Object: Computer vision
 - Technology: Amazon Rekognition

Layer: Service Oriented Architecture

- Object: Web Services
 - Technology: SOAP
- Object: Application Programming Interfaces
 - Technology: JSON REST APIs
- Object: IoT device data brokering
 - Technology: MQTT

Layer: Infrastructure and Storage

- Object: Database storage
 - Technology: AWS RDS and S3
- Object: Open data
 - Technology: ESRI Open Data Hub
- Object: Secure data storage and analytics
 - Technology: NB-IRDT
- Object: Cloud backup
 - Technology: MS Azure Blob
- Object: Infrastructure and servers
 - Technology: MS Azure, AWS EC2

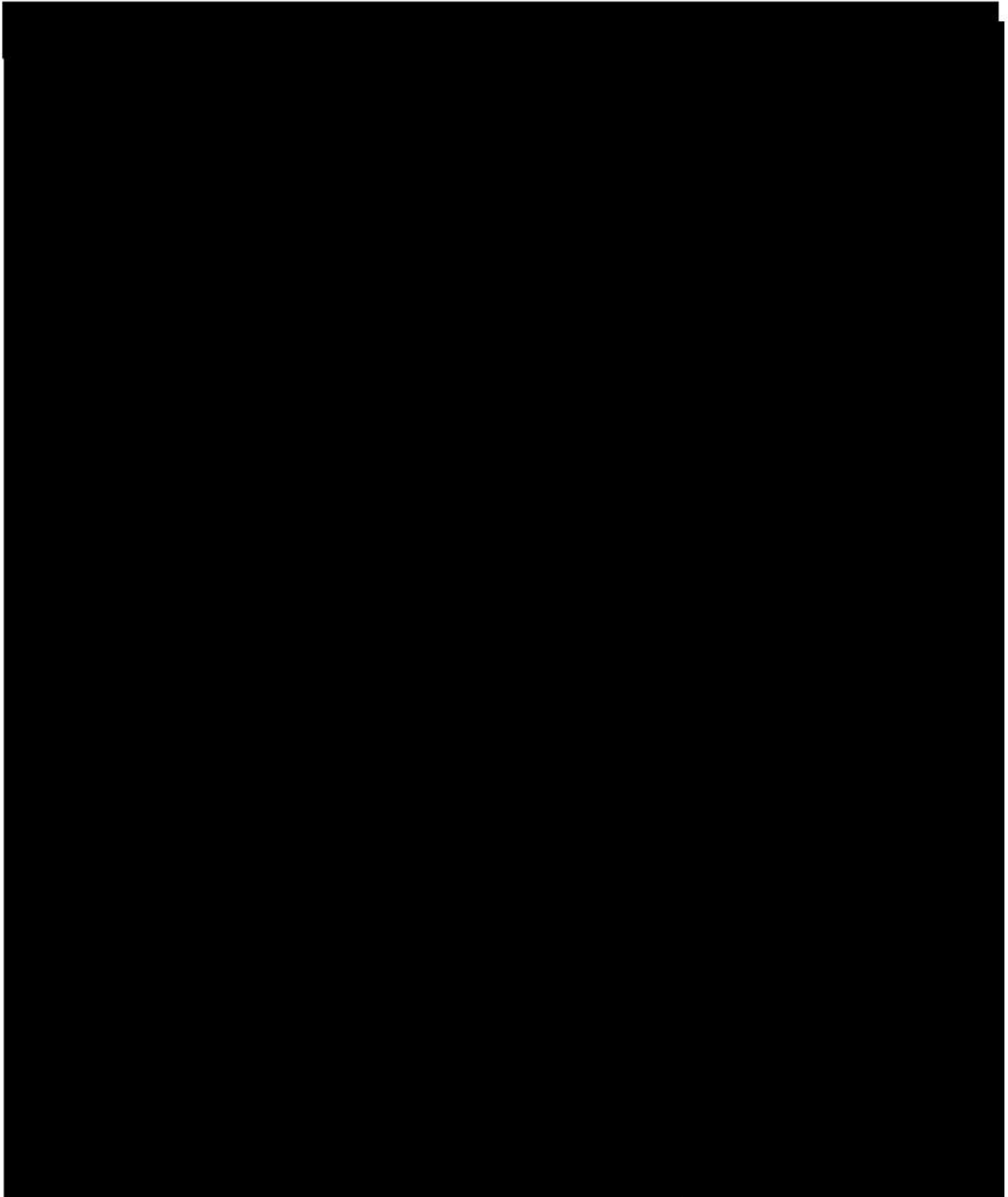
Layer: Network

- Object: Municipal fibre network
 - Technology: F6 Networks
- Object: Public WiFi
 - Technology: e-Novations
- Object: Cellular 4G, 5G
 - Technology: Rogers
- Object: Telemetry IoT network
 - Technology: LoRaWAN by eleven-X
- Object: Security monitoring
 - Technology: IBM Q-Radar

Layer: Edge Devices

- Object: WiFi Access Points
 - Technology: Fortinet
- Object: Cameras
 - Technology: Cisco
- Object: Smart water meters
 - Technology: eleven-X
- Object: Digital displays
 - Technology: Samsung
- Object: Urban telemetry sensors
 - Technology: LoRaWAN IoT protocol

Page 63 – Stakeholder/Partner Roles, Contacts,
Capacity/Readiness and Impact/Influence



**Page 375
is withheld
pursuant to paragraph
13(1)(d) and 19(1)
of the *Access to Information Act***

**La page 375
Font l'objet d'une exception totale
conformément aux dispositions de paragraphe
13(1)(d) et 19(1)
de la *loi sur l'accès à l'information***

Page 76-78 Comprehensive Project Budget

Revenue Including Own-Source and Partner Contributions

Own Source Revenue (31% of funding; total \$4,740,000 over 2019-2023):

- City of Fredericton Capital Budget for Digital Fredericton Core Systems
 - 2019 – \$1,040,000
 - 2020 – \$500,000
 - 2021 – \$500,000
 - 2022 – \$500,000
 - 2023 – \$500,000
 - Total – \$3,040,000
- City of Fredericton Capital Budget for IoT sensors and new use cases
 - 2020 – \$25,000
 - 2021 – \$25,000
 - 2022 – \$25,000
 - Total – \$75,000
- City of Fredericton Operating Funds - Staff Salaries for Smart Cities
 - 2019 – \$150,000
 - 2020 – \$150,000
 - 2021 – \$150,000
 - 2022 – \$150,000
 - 2023 – \$150,000
 - Total – \$750,000
- City of Fredericton - IT Investments in New Cybersecurity
 - 2019 – \$100,000
 - 2020 – \$100,000
 - 2021 – \$100,000
 - 2022 – \$100,000
 - 2023 – \$100,000
 - Total – \$500,000
- e-Novations Comnet Inc. - Investment in free community WIFI
 - 2019 – \$375,000
 - Total – \$375,000

Direct Partner Contributions (3% of funding: total \$400,000 over 2019-2023):

- Confidential partner In-kind Investment in Innovation and data connections
 - 2019 – \$100,000
 - 2020 – \$100,000
 - 2021 – \$100,000
 - Total – \$300,000
- ESRI - In-kind professional services contribution for Digital Community Hub
 - 2019 – \$20,000
 - 2020 – \$20,000
 - 2021 – \$20,000
 - 2022 – \$20,000
 - 2023 – \$20,000
 - Total – \$100,000

Infrastructure Canada Milestone Outcomes Based Payment (66% of funding; total \$10,000,000 over 2019-2023)

- 2019 – \$1,925,000
- 2020 – \$3,320,000
- 2021 – \$1,895,000
- 2022 – \$1,480,000
- 2023 – \$1,380,000
- Total – \$10,000,000

Total funding from all sources:

- 2019 – \$3,710,000
- 2020 – \$4,215,000
- 2021 – \$2,790,000
- 2022 – \$2,275,000
- 2023 – \$2,150,000
- Total – \$15,140,000

Expenditures for Outcomes

Digital Fredericton

- **Core e-government services (total expenditures of \$6,890,000 over 2019-2023)**
 - Utilities and Customer Billing
 - 2020 – \$1,000,000
 - Total – \$1,000,000
 - Work Management and Field Service Delivery:
 - 2021 – \$1,000,000
 - Total – \$1,200,000
 - Digital Talent Strategy

- 2019 – \$150,000
 - Total – \$150,000
- HR Scheduling
 - 2020 – \$875,000
 - Total – \$875,000
- Talent and Performance Management
 - 2021 – \$1,425,000
 - Total – \$1,425,000
- Citizen Experience Strategy
 - 2019 – \$240,000
 - Total – \$240,000
- Customer Relationship Management / 311 services
 - 2022 – \$1,000,000
 - 2023 – \$1,000,000
 - Total – \$2,000,000
- **Customer Experience Strategy (total expenditures of \$1,500,00 over 2019-2023)**
 - Ethnographic Research (2 segments per year)
 - 2020 – \$50,000
 - 2021 – \$50,000
 - 2022 – \$100,000
 - 2023 – \$50,000
 - Total – \$250,000
 - First Nations specific ethnographic research (2 segments - directed by SMFN)
 - 2019 – \$50,000
 - 2020 – \$50,000
 - 2021 – \$50,000
 - Total – \$150,000
 - Idea creation and user centred prototype design from ethnography insights
 - 2019 – \$20,000
 - 2020 – \$20,000
 - 2021 – \$20,000
 - 2022 – \$20,000
 - 2023 – \$20,000
 - Total – \$100,000
 - Digital Inclusion Tools application and technology development and innovation
 - 2019 – \$125,000
 - 2020 – \$250,000
 - 2022 – \$250,000
 - 2023 – \$125,000
 - Total – \$750,000
 - First Nations specific digital tools resulting from ethnography

- 2021 – \$250,000
- Total – \$250,000

NPO data collaboration (total expenditures of \$880,000 over 2019-2023)

- Establish core systems and digital processes and acquire resources and talent
 - 2019 – \$140,000
 - Total – \$140,000
- Onboard early adopters
 - 2020 – \$215,000
 - Total – \$215,000
- Build capacity and share data
 - 2021 – \$175,000
 - Total – \$175,000
- Expand project and build data analysis capacity
 - 2022 – \$175,000
 - Total – \$175,000
- Link data and connect aggregate data to Dashboard Community Hub
 - 2023 – \$175,000
 - Total – \$175,000

Road Home (total expenditures of \$525,000 over 2019-2023)

- Initialize digital core systems for shared client intake and case management
- Build Digital Inclusion Infrastructure and provide user technology
 - 2019 – \$60,000
 - 2021 – \$4,000
 - 2022 – \$4,000
 - Total – \$68,000
- Provide technology resources for First Nations shelter
 - 2019 – \$30,000
 - 2021 – \$1,000
 - 2022 – \$1,000
 - Total – \$32,000
- Upgrade free Public WIFI in Downtown Public Spaces and on Transit Buses
 - 2019 – \$300,000
 - Total – \$300,000
- Create personalized digital inclusion tools - "Digital Street Guide"
 - 2020 – \$125,000
 - Total – \$125,000

Doorable (total expenditures of \$1,150,000 over 2019-2023)

- Application and hardware development and technology platform
 - 2019 – \$315,000

- 2020 – \$102,000
 - Total – \$417,000
- Deploy hardware and software
 - 2019 – \$190,000
 - 2020 – \$85,000
 - 2021 – \$55,000
 - Total – \$330,000
- Map accessible city
 - 2019 – \$135,000
 - Total – \$135,000
- Create "Doorable" on-line community
 - 2020 – \$80,000
 - 2021 – \$173,000
 - Total – \$253,000
- Integrate IoT parking sensor data to application
 - 2021 – \$15,000
 - Total – \$15,000

Dashboard, Digital Community Hub (total expenditures of \$1,530,000 over 2019-2023)

- Project mobilization with Data Analyst, Digital Community Hub Coordinator
 - 2019 – \$345,000
 - Total – \$345,000
- Technology procurement and platform development
 - 2019 – \$60,000
 - 2020 – \$60,000
 - 2021 – \$60,000
 - 2022 – \$15,000
 - 2023 – \$10,000
 - Total – \$205,000
- Build content and create user base
 - N/A
- Release #1 - Accessible & Supportive
 - 2020 – \$210,000
 - Total – \$210,000
- Release #2 - Cultural Connectedness
 - 2021 – \$245,000
 - Total – \$245,000
- Release #3 - Economic Inclusion & Dashboard
 - 2022 – \$245,000
 - Total – \$245,000
- Release #4 - NPO and Community Hub
 - 2023 – \$280,000
 - Total – \$280,000

Transformation Management (total expenditures of \$2,665,000 over 2019-2023)

- Transformation and communications team consulting services
 - 2019 – \$350,000
 - 2020 – \$130,000
 - 2021 – \$130,000
 - 2022 – \$130,000
 - 2023 – \$130,000
 - Total – \$870,000
- Privacy Officer (Virtual Privacy Officer - Annual Review)
 - 2019 – \$20,000
 - 2020 – \$15,000
 - 2021 – \$15,000
 - 2022 – \$15,000
 - 2023 – \$15,000
 - Total – \$80,000
- Smart Cities innovation lab space
 - 2019 – \$10,000
 - 2020 – \$20,000
 - 2021 – \$20,000
 - 2022 – \$20,000
 - 2023 – \$20,000
 - Total – \$90,000
- SMFN dedicated lead for ethnography and technology initiatives
 - 2019 – \$75,000
 - 2020 – \$75,000
 - 2021 – \$75,000
 - 2022 – \$75,000
 - 2023 – \$75,000
 - Total – \$375,000
- Project Management - City staff dedicated to project
 - 2019 – \$150,000
 - 2020 – \$150,000
 - 2021 – \$150,000
 - 2022 – \$150,000
 - 2023 – \$150,000
 - Total – \$750,000
- Cybersecurity (Virtual CISO and Security Operations Monitoring)
 - 2019 – \$100,000
 - 2020 – \$100,000
 - 2021 – \$100,000
 - 2022 – \$100,000
 - 2023 – \$100,000
 - Total – \$500,000

Total expenditures for outcomes across all areas:

- 2019 – \$2,865,000
- 2020 – \$3,612,000

- 2021 – \$4,213,000
- 2022 – \$2,300,000
- 2023 – \$2,150,000
- Total – \$15,140,000

Cashflow is positive \$845,000 in 2019, positive \$603,000 in 2020, negative \$1,423,000 in 2021, negative \$25,000 in 2022, and breakeven in 2023.

Page 84-94 – Project Costs with Timelines

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Road Home project breakdown with phases, milestones and cost

Phase	HIFIS4 Deployment
Phase Duration	Ongoing
Milestone	HIFIS Coordinator
Cost	In-Kind
Phase	HIFIS4 Deployment
Phase Duration	September to November 2019
Milestone	Onboard 5 agencies: (Fredericton Homeless Shelters Inc., John Howard Society of Fredericton, Capital Region Mental Health & Addictions, Youth in Transition, Liberty Lane)
Milestone Date	December 2018
Phase	HIFIS4 Deployment
Phase Duration	January to March 2019
Milestone	Complete data transfer from HIFIS3 to HIFIS4
Milestone Date	March 2019
Cost	Grant
Phase	Training
Phase Duration	February to July 2019
Milestone	Create training capacity for HIFIS, SPDAT (train the trainers) & develop user manual
Milestone Date	July 2019
Cost	grant
Phase	Technology
Phase Duration	July to November 2019
Milestone	Deploy digital infrastructure/user tech to agencies above (fibre, hardware/software, licensing)
Milestone Date	July 2019
Cost	\$60,000
Phase	Technology

Phase Duration	2019
Milestone	Upgrade free public Wi-Fi/
Milestone Date	2019
Cost	\$150,000
Phase	Service Coordination
Phase Duration	July 2019 to July 2020
Milestone	Onboard 3 additional agencies & coordinate services (St. Mary's First Nation shelter, Gignoo, Women in Transition)
Milestone Date	July 2020
Cost	\$0
Phase	Technology
Phase Duration	July to November 2020
Milestone	Deploy digital infrastructure (fibre, hardware, licensing) – First Nations shelter
Milestone Date	July 2020
Cost	\$30,000
Phase	Technology
Phase Duration	2020
Milestone	Upgrade free public Wi-Fi/
Milestone Date	2020
Cost	\$150,000
Phase	Service Coordination
Phase Duration	July 2019 to July 2020
Milestone	Onboard 1 additional agency & coordinate services:
Milestone Date	July 2021
Cost	\$0
Phase	Service Coordination
Phase Duration	February 2019 to July 2021
Milestone	Fredericton Downtown Health Clinic
Cost	\$0
Phase	Service Coordination
Phase Duration	February 2019 to July 2021
Milestone	Coordinate intake & assessment & triage model among 9 agencies, identify opportunities for improvement (OFIs)
Milestone Date	July 2021
Cost	\$0
Phase	Technology
Milestone	Digital inclusion infrastructure & tech resources (First Nations)
Milestone Date	July 2021
Cost	\$4,000

Phase	Technology
Cost	\$1,000
Phase	App Development
Phase Duration	July 2019 to April 2021
Milestone	Create personalized digital inclusion applications/tools (i.e. digitized street survival guide)
Milestone Date	April 2021
Cost	\$125,000
Phase	Digital Community Hub
Phase Duration	August 2020
Milestone	Coordinate high level aggregate data based on indicators to 'city performance dashboard' & personal level resources
Milestone Date	April 2021
Cost	\$0
Phase	Technology
Milestone	Digital inclusion infrastructure & tech resources (First Nations)
Milestone Date	July 2022
Cost	\$4,000
Phase	Technology
Milestone	Digital inclusion infrastructure & tech resources (First Nations)
Cost	\$1,000
Phase	Sustainability Plan
Milestone	Coordinate plan among agencies.
Milestone Date	2023
Cost	\$0
Total	\$525,000

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Non-Profit Data Collaboration project breakdown with phases, milestones and cost

Phase	Mobilize	Admin-HR
Phase Duration	July 2019 to March 2020	
Milestone	Recruit, hire, orientate 3 staff: Project Manager (GFSI)Process design consultant (GFSI)Data analyst (IRDT)Develop communication/ engagement plan	
Milestone Date	March 2020	
Cost	\$140,000	

Phase	Loop 1 – early adopters	Project Management:
process design, data-sharing agreements & onboarding		
Phase Duration	April 2020 to March 2021	
Milestone	Privacy and data sharing agreements signed with 10-NPOs	
Project protocols and organizational targets refined and approved data management assets and practices of 10 NPOs mapped	10 NPOs trained in in-house data analysis Phase 1 of process tool-kit developed	
Milestone Date	April 2020	
Cost	\$100,000	
Phase	Loop 1 – early adopters	Data security & Privacy
Standards		
Phase Duration	April 2020 to March 2021	
Milestone	10 NPOs privacy impact assessments completed, common data standards defined	
data sharing agreements created and signed	10 NPOs privacy and ethics compliance completed	
Milestone Date	March 2021	
Cost	\$80,000	
Phase	Loop 1 – early adopters	Build NPO capacity
Phase Duration	April 2020 to March 2021	
Milestone	data sharing agreements signed	
privacy/confidentiality guidelines/templates implemented	trained to link/analyze/explore in-house data NPO successes and gaps identified	
Milestone Date	March 2021	
Cost	\$15,000	
Phase	Loop 1 – early adopters	United Way & Fredericton Community Foundation
Phase Duration	April 2020 to March 2021	
Milestone	Creation/updated online funding applications with new data standards	
Consulted with partner agencies		
Milestone Date	March 2021	
Cost	\$20,000	
Phase	Loop 2	data-sharing
agreements, onboarding 10 new Agencies		
Phase Duration	April 2021 to March 2022	
Milestone	onboarded 10 new agencies	
privacy and data sharing agreements signed	project protocols and organizational targets develop and approved data management assets and practices mapped	
10 NPOs trained in data analysis	Testimonials and case studies from NPOs of improvements made based on data	
Process tool-kit completed		
Milestone Date	March 2022	
Cost	\$80,000	
Phase	Loop 2	Data Security & Privacy
Standards		
Phase Duration	April 2021 to March 2022	

Milestone	10 NPOs privacy impact assessments completed, common data standards defined 10 NPOs privacy and ethics compliance data transferred to IRDT de-identify and data cleaning NPO data aggregated and anonymize to the community level link data to GNB data portals & Digital Community Hub	
Milestone Date	March 2022	
Cost	\$80,000	
Phase	Loop 2	Build NPO capacity
Phase Duration	April 2021 to March 2022	
Milestone	data sharing agreements signed privacy/confidentiality guidelines/templates implemented trained to analyze/explore in-house data trained to analyze/explore community-level data NPO successes and gaps identified	
Milestone Date	March 2022	
Cost	\$15,000	
Phase	Loop 3	data-sharing
	agreements, onboarding	
Phase Duration	April 2022 to March 2023	
Milestone	privacy and data sharing agreements signed with 10-NPOs data management assets and practices mapped trained 10 NPOs on data analysis	
Milestone Date	March 2023	
Cost	\$80,000	
Phase	Loop 3	Data security, Linking, &
	Privacy Standards	
Phase Duration	April 2022 to March 2023	
Milestone	10 NPOs privacy impact assessments completed, common data standards defined Testimonials and case studies from NPOs of improvements made based on data 10 NPOs Privacy and ethics compliance transfer data to IRDT de-identify and data cleaning NPO data aggregated and anonymize to the community level link data to GNB data portals & Digital Community Hub	
Milestone Date	March 2023	
Cost	\$80,000	
Phase	Loop 3	NPO Capacity Building
Phase Duration	April 2022 to March 2023	
Milestone	data sharing agreements signed Privacy/confidentiality guidelines/templates implemented train to analyze/explore in-house data train to analyze/explore community-level data NPO successes and gaps identified	
Milestone Date	March 2023	
Cost	\$15,000	
Phase	Loop 4	data-sharing
	agreements, onboarding	
Phase Duration	April 2023 to March 2024	
Milestone	privacy and data sharing agreements signed with 10-NPOs develop and sign off on project protocols and organizational target strained 10 NPOs on	

data analysis data management assets and practices mapped testimonials and case studies from NPOs of improvements made based on data

Milestone Date March 2024
Cost \$80,000

Phase Loop 4 Data Security & Privacy Standards

Phase Duration April 2023 to March 2024

Milestone 10 NPOs privacy impact assessments completed, common data standards defined 10 NPOs Privacy and ethics compliance transfer data to IRDT de-identify and data cleaning NPO data aggregated and anonymize to the community level link data to GNB data portals & Digital Community Hub

Milestone Date March 2024
Cost \$80,000

Phase Loop 4 NPO Capacity Building

Phase Duration April 2023 to March 2024

Milestone data sharing agreements signed privacy/confidentiality guidelines/templates implemented train to analyze/explore in-house data train to analyze/explore community-level data NPO successes and gaps identified

Milestone Date March 2024
Cost \$15,000

Total \$879,000

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Digital Fredericton Agile approach with Sprint outline phases, milestones and cost

Project Category: Work Management & Field Service Delivery

Phase Prework
Phase Duration July 2019 to February 2020
Milestone Product selection finalized Product licensing (annual) Internal team identification
Cost \$50,000

Phase Prework
Milestone Develop workplan Create status report templates Develop instance & integration strategy Develop test strategy Develop high level change management plan Confirm user stories
Cost \$150,000

Phase Sprint 1 and 2
Milestone Project financials Project costing Inventory
Cost \$200,000

Phase	Sprint 3
Milestone	Field service core manage cloud & field service mobility cloud
Maintenance management	
Cost	\$150,000

Phase	Sprint 4
Milestone	Field service customer communication & field service routing
Smart location cloud	
Cost	\$150,000

Phase	Testing
Milestone	Systems integration testing & user acceptance testing
Cost	\$150,000

Phase	Deploy
Milestone	Process redesign & capability development
Cost	\$150,000

Phase	Deploy
Milestone	Product cutover/support & transition
Cost	\$100,000

Milestone Date	February 2020	
Work Management & Field Service Delivery Sub-total		\$1,200,000

Project Category: Utilities & Customer Billing

Phase	Pework	July to December 2020
Milestone	Product selection finalized	Product licensing (annual)Internal team
identification		
Cost	\$100,000	

Phase	Sprint 0
Milestone	Develop workplan Create status report templates Develop instance & integration strategy Develop test strategy Develop high level change management plan Confirm user stories
Cost	\$50,000

Phase	Sprint 1
Milestone	Accounts receivable Contracts cloud service Development
Cost	\$300,000

Phase	Sprint 2
Milestone	Order management cloud
Cost	\$125,000

Phase	Sprint 3
Milestone	Advanced collections

Cost	\$125,000
Phase	Testing
Milestone	Systems integration testing User acceptance testing
Cost	\$100,000
Phase	Deploy
Milestone	Process redesign & capability development
Cost	\$150,000
Phase	Deploy
Milestone	Product cutover/support/ transition
Cost	\$50,000

Milestone Date December 2020
Utilities & Customer Billing Sub-total: \$1,000,000

Project Category: Talent & Performance Management

Phase	Pework	January to December 2012
Milestone	Product selection finalized	Product licensing (annual)Internal team
Identification		
Cost	\$50,000	
Phase	Sprint 0	
Milestone	Develop workplan Create status report templates Develop instance & integration strategy Develop test strategy Develop high level change management plan Confirm user stories	
Cost	\$100,000	
Phase	Sprint 1	
Milestone	Talent acquisition Succession management	
Cost	\$250,000	
Phase	Sprint 2	
Milestone	Learning cloud service	
Cost	\$250,000	
Phase	Sprint 3	
Milestone	Performance management	
Cost	\$250,000	
Phase	Testing	
Milestone	Systems Integration testing User acceptance testing	
Cost	\$250,000	
Phase	Deploy	

Milestone	Process redesign & capability development
Cost	\$150,000
Phase	Deploy
Milestone	Product cutover/support/ transition
Cost	\$125,000
Milestone Date	December 2021
Talent & Performance Management	\$1,425,000

Project Category: CRM/Portal

Phase	Prework	July to December
2019		
Milestone	Product selection finalized	Product licensing (annual)Internal team
identification		
Cost	\$400,000	
Phase	Sprint 0	
Milestone	Develop workplan	Create status report templates
instance & integration strategy	Develop test strategy	Develop high level change management
plan	Confirm user stories	
Cost	\$400,000	
Phase	9 sprints	
Milestone	Citizen portal	Enterprise contact center
Cost	\$900,000	Interface cloud service
Phase	Testing	
Milestone	Systems Integration testing	User acceptance testing
Cost	\$200,000	
Phase	Deploy	
Milestone	Product cutover/support/ transition	
Cost	\$100,000	
Milestone Date	December 2023	
CRM/Portal sub-total	\$2,000,000	

Project Category: Customer Experience Strategy including annual repeated cycle: ethnography, insights, ideation, prototyping, tool

Phase	July 2019 to July 2023
Milestone	Citizen experience strategy
Cost	\$240,000

Phase	2021	
Milestone	Ethnography research (2 segments per year)	
Cost	\$300,000	
Phase	2019	
Milestone	First Nations specific ethnographic research (2 segments directed by SMFN)	
Cost	\$100	
Phase	annually	
Milestone	Ideation & prototyping based on insights	
Cost	\$100,000	
Phase	2019	
Milestone	Digital inclusion tools, application/tech development and innovation	
Cost	\$125,000	
Phase	2020	
Milestone	Digital inclusion tools, application/tech development and innovation	
Cost	\$250,000	
Phase	2021	
Milestone	Digital inclusion tools, application/tech development and innovation	
Cost	\$125,000	
Phase	2022	
Milestone	Digital inclusion tools, application/tech development and innovation	
Cost	\$125,000	
Phase	2023	
Milestone	Digital inclusion tools, application/tech development and innovation	
Cost	\$125,000	
Phase	2021	
Milestone	First Nations specific digital tools resulting from ethnography	
Cost	\$125,000	
Phase	2022	
Milestone	First Nations specific digital tools resulting from ethnography	
Cost	\$125,000	
Milestone Date	December 2023	
Customer Experience Strategy sub total		\$1,740,000

Project Category: Digital Talent Strategy

Phase	Sprint 1	July 2019 to December 2019
Milestone	Digital employee talent proposition Define Skills identification	
Skills gap		
Cost	\$100,000	
Phase	Sprint 2	
Milestone	Talent modelling Governance	
Cost	\$50,000	
Milestone Date	December 2019	
Digital Talent Strategy Sub-total:	\$150,000	

Project Category: HR Scheduling

Phase	Pework	January to December
2020 Milestone	Product selection finalized Product licensing (annual) Internal team identification	
Cost	\$150,000	
Phase	Sprint 0	
Milestone	Develop workplan Create status report templates Develop instance & integration strategy Develop test strategy Develop high level change management plan Confirm user stories	
Cost	\$50,000	
Phase	Sprint 1-3	
Milestone	Scheduling	
Cost	\$375,000	
Phase	Testing	
Milestone	Systems Integration testing User acceptance testing	
Cost	\$100,000	
Phase	Deploy	
Milestone	Process redesign & capability development	
Cost	\$150,000	
Phase	Deploy	
Milestone	Product cutover/support/ transition	
Cost	\$50,000	
Milestone Date:	December 2020	
HR Scheduling Sub-total:	\$875,000	

Project Category: Transformation Management

Phase	Digital Fredericton TMO, marketing and communications
Duration	2019
Cost	\$325,000
Phase	Digital Fredericton TMO, marketing and communications
Duration	2020
Cost	\$125,000
Phase	Digital Fredericton TMO, marketing and communications
Duration	2021
Cost	\$125,000
Phase	Digital Fredericton TMO, marketing and communications
Duration	2022
Cost	\$125,000
Phase	Digital Fredericton TMO, marketing and communications
Duration	2023
Cost	\$125,000
Phase	Virtual Privacy officer
Duration	2019
Cost	\$20,000
Phase	Virtual Privacy officer
Duration	2020
Cost	\$15,000
Phase	Virtual Privacy officer
Duration	2021
Cost	\$15,000
Phase	Virtual Privacy officer
Duration	2022
Cost	\$15,000
Phase	Virtual Privacy officer
Duration	2023
Cost	\$15,000
Phase	Smart cities collaboration space
Duration	2019
Cost	\$10,000
Phase	Smart cities collaboration space
Duration	2020
Cost	\$20,000

Phase	Smart cities collaboration space
Duration	2021
Cost	\$20,000
Phase	Smart cities collaboration space
Duration	2022
Cost	\$20,000
Phase	Smart cities collaboration space
Duration	2023
Cost	\$20,000
Phase	SMFN lead for ethnography and tech initiatives
Duration	annual
Cost	\$375,000
Phase	Smart Cities project management – dedicated staff
Duration	annual
Cost	\$750,000
Phase	Cybersecurity (virtual Chief Information Security Officer & security operations monitoring)
Duration	annual
Cost	\$500,000

Transformation Management sub-total

\$2,620,000

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Digital Community Hub project breakdown with phases, milestones and cost

Phase	Project Mobilization	
Phase Duration		July 1-Aug 1/19
Milestone	Develop skill requirements and advertise posting (2 weeks) for data analyst, digital community hub coordinator, content creator	
Milestone Date		August 2019
Cost	\$345,000	
Phase	Admin-HR	
Phase Duration		Aug 1-31
Milestone	Screen, interview candidates, select/sign contracts and set start dates (Oct 1 latest).	
Milestone Date		
Cost	\$0	
Phase	Admin-Technology Procurement	

Phase Duration	July 1-Sept 1/19
Milestone	Develop RFP package, tender/award project for platform development.
Milestone Date	September 2019
Cost	\$60,000
Phase	Platform Development
Phase Duration	Sept 15/19-Feb 15/20
Milestone	Develop Digital Community Hub platform ensuring compliance with data & security requirements (conduct user testing where required) for:
Milestone Date	February 2019
Cost	\$0
Phase	Platform Development
Milestone	1. Smart City Dashboard
Milestone Date	February 2019
Cost	\$0
Phase	Platform Development
Milestone	3. Personal Digital Inclusion
Milestone Date	February 2019
Cost	\$0
Phase	Data Sharing Agreements
Phase Duration	Oct 1-Nov 1
Milestone	Sign 5 partnership agreements (Ability NB, Age Friendly Committee, CAGH, Appdigenous, NB-IRDT)
Milestone Date	November 2019
Cost	\$0
Phase	Ethnography,
Phase Duration	Aug 1-Oct 1/19
Milestone	Via Digital Fredericton – conduct ethnographic research for 2 segments
Milestone Date	October 2019
Cost	\$0
Phase	Data Input & Testing
Milestone	
Milestone Date	
Cost	\$0
Phase	Data Input & Testing
Phase Duration	Oct 1-Dec 1/
Milestone	Collect & input segment baseline data for dashboards
Milestone Date	December 2019
Cost	\$0
Phase	Data Input & Testing
Phase Duration	Early Feb/20

Milestone	Pilot /user-centred design testing for 3 segments	
Milestone Date		February 2020
Cost	\$0	
Phase	Data Sharing Agreements	
Phase Duration		Nov 1/19-Feb 1/20
Milestone	Sign 5 data sharing agreements: TBA	
Milestone Date		February 2020
Cost	\$0	
Phase	Release #1	
Phase Duration		Feb 19-Mar 31/20
Milestone	Develop/deploy communications campaign / launch dashboard.	
Milestone Date		April 2020
Cost	\$245,000	
Phase	Release #1	Feb 19-Mar 31/20
Milestone	Personal/2 segments +performance:	
Milestone Date		April 2020
Cost	\$0	
Phase	Release #1	Feb 19-Mar 31/20
Milestone	older adults community hub + integrate LiveKool	
Milestone Date		April 2020
Cost	\$0	
Phase	Release #1	Feb 19-Mar 31/20
Milestone	accessibility challenged (accessible community hub w/ data & map)	
Milestone Date		April 2020
Cost	\$0	
Phase	Release #1	Feb 19-Mar 31/20
Milestone	Smart City Performance Level	
Milestone Date		April 2020
Cost	\$0	
Phase	Release #1	Feb 19-Mar 31/20
Milestone	First Nations segment	
Milestone Date		April 2020
Cost	\$0	
Phase	Data Renewal Process	
Phase Duration		April 1-June 1/20

Milestone	Create process for data refinement and identification	
Milestone Date		June 2020
Cost	\$0	
Phase	Platform Development	
Phase Duration		Feb 19-Sept
	1/20	
Milestone	Develop dashboard platform for Personal Interactive Level	
Milestone Date		September
	2020	
Cost	\$60,000	
Phase	Census 1	
Milestone	Establish 1,000 users / annual survey / produce community census	
Milestone Date		November 2020
Cost	\$0	
Phase	Ethnography, Design Testing &	
Phase Duration		Aug 1/20-Feb
	19/21	
Milestone	2 segments + 1 SMFN segment	
Milestone Date		
Cost	\$0	
Phase	Data Input	
Milestone Date		February 2021
Cost	\$0	
Phase	Release #2	
Phase Duration		Feb 19-Mar
	31/21	
Milestone	Personal/3 segments + interactive:	
Milestone Date		April 2021
Cost	\$245,000	
Phase	Release #2	Feb
	19-Mar 31/21	
Milestone	Road home community hub (homeless segment including digital street guide)	
Milestone Date		April 2021
Cost	\$0	
Phase	Release #2	Feb
	19-Mar 31/21	
Milestone	Cultural /Newcomers community hub + integrate Hullo	
Milestone Date		April 2021
Cost	\$0	
Phase	Release #2	Feb
	19-Mar 31/21	
Milestone	SMFN	

Milestone Date	April 2021
Cost \$0	
Phase Release #2	Feb
19-Mar 31/21	
Milestone +Personal interactive level	
Milestone Date	April 2021
Cost \$0	
Phase Platform Development	
Phase Duration	Feb 19—Sept
1/21	
Milestone Develop dashboard platform for Organizational Level	
Milestone Date	September
2021	
Cost \$60,000	
Phase Ethnography, Design Testing &	
Phase Duration	Aug 1/21-Feb
19/22	
Milestone 2 segments + SMFN	
Milestone Date	February 2022
Cost \$0	
Phase Data Input	
Milestone	
Milestone Date	
Cost \$0	
Phase Platform Development	
Phase Duration	Feb 19-Sept
1/22	
Milestone Develop dashboard platform for Organizational Level	
Milestone Date	September
2022	
Cost \$15,000	
Phase Census 2	Feb
19-Sept 1/22	
Milestone Establish 2,000 users / annual survey for community census	
Milestone Date	November
2021	
Cost \$0	
Phase Release #3	
Phase Duration	Feb 19-Mar
31/22	
Milestone Personal/3 segments (TBA) +community hub of interest and integrate user experience tech, applications and data	
Milestone Date	April 2022
Cost \$245,000	

Phase	Ethnography, Design Testing &	
Phase Duration	19/23	Aug 1/22-Feb
Milestone	2 segments + SMFN	
Milestone Date		February 2023
Cost	\$0	
Phase	Data Input	Aug
Phase Duration	1/22-Feb 19/23	
Milestone		
Milestone Date		
Cost	\$0	
Phase	Census 3	Aug
Phase Duration	1/22-Feb 19/23	
Milestone	Establish 5,000 users / annual survey / produce community census	
Milestone Date		November 2022
Cost	\$0	
Phase	Release #4	
Phase Duration	31/23	Feb 19-Mar
Milestone	Personal Level – 3 segments + organizational level	
Milestone Date		April 2023
Cost	\$0	
Phase	Ethnography, Design testing & Data Input	
Phase Duration		Aug 1-Dec 1/23
Milestone	2 segments + SMFN	
Milestone Date		December 2023
Cost	\$0	
Phase	Census 4	Aug
Phase Duration	1-Dec 1/23	
Milestone	Establish 10,000 users / annual survey / produce community census	
Milestone Date		November 2023
Cost	\$245,000	
Phase	Platform Development	Aug
Phase Duration	1-Dec 1/23	
Milestone	Continued dashboard development for sustainability	
Milestone Date	2023	September
Cost	\$10,000	
Phase	Sustainability	Aug
Phase Duration	1-Dec 1/23	
Milestone	Create project sustainability plan	
Milestone Date	2023	September

Cost \$0

Digital Community Hub Sub-total \$1,530,000

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Doorable project breakdown with phases, milestones and cost

Phase Mgt Team & Talent Acquisition

Phase Duration Feb 15-July 15/19

Milestone *Mgt team currently in place .Recruit technical staff, installers, CRM staff

Milestone Date July 15/19

Cost \$0

Phase Testbed of Users Created

Phase Duration Feb 15-June 30/19

Milestone 250 downloads of Doorable app. Ver1.0

Milestone Date June 30/19

Cost \$0

Phase Sustainability Plan

Phase Duration Feb 15-Dec 31/19

Milestone The Smart Cities funding, which in effect subsidizes 1000 installs of Doorable tech, generates sufficient revenue to undertake the development and growth of the technology as described in the budget. Costs unmet by the launch project are met by install purchases from organizations and businesses as well as through services offered to subscribers.

Milestone Date Dec 31/19

Cost \$0

Phase Research Strategy: Baseline Fredericton

Phase Duration May 6-Oct 11/19

Milestone Conduct inventory of all button accessible doors in Fredericton, and make available via Hub

Milestone Date Oct 11/19

Cost \$135,000

Phase Commercial SubscribersTestbed (subsidized installs)

Phase Duration May 19-Sept30/19

Milestone Sign 5 commercial customers and install hardware (testers)Private sector subscriber consultative group established

Milestone Date June 30/19

Cost \$0

Phase Intellectual Property

Phase Duration June 1-Aug 30/19

Milestone Develop patentable design schematics on DOORABLE hardware (Release 2)

Milestone Date Aug 30/19

Cost \$0

Phase Hardware Development: Web-based Black Box (Version 2) & Testing

Phase Duration June 1-Aug 30/19

Milestone Develop Version 2 of Doorable hardware with both wireless and internet connectivity allowing Doorable Release 2 of the User App to be a web capable (future proofing the hardware)

Milestone Date Aug 30/19
Cost \$92,000

Phase Mobile application design and implementation: Installer application version 1
Phase Duration July 1-Aug 30,19

Milestone Develop Installer App to populate Data base of "Doorable" accessible doors on the "back end" and initialize device

Milestone Date Aug 30/19
Cost \$35,000

Phase Advisory Board

Phase Duration July 3-Aug 3/19

Milestone Constitute advisory board

Milestone Date Aug 3/19
Cost \$0

Phase SaaS Model

Phase Duration Aug 1-Dec 31/19

Milestone Create pricing structure for basic level of content management associated with Subscriber app.

Milestone Date Dec 31/19
Cost \$0

Phase Public Building Retrofits (Phase 1)

Phase Duration Sept 1-July 1/19

Milestone Fit all public buildings owned/ operated by Fredericton/St. Mary's with Doorable technology (HW Release 2)

Milestone Date July 1/20
Cost \$150,000

Phase Non-Profits-Retrofit Installations (Phase 2)

Phase Duration Sept 1-Oct 15/19

Milestone Fit NPOs participating in Smart Cities Proposal with Doorable (HW Release 2)

Milestone Date Oct 15/19
Cost \$0

Phase Hardware Upgrades in Test Sites

Phase Duration Sept 1-Oct 30/19

Milestone Conduct testing at Bluetooth enabled door (by Aug/19, the future proofed web capable units will be ready)

Milestone Date Oct 30/19
Cost \$150,000

Phase Commercialization/ Market Entry Strategy

Phase Duration

Milestone (See Appendix - Business Model)

Cost \$0

Phase User Education & Awareness Campaign

Phase Duration Ongoing

Milestone Enable online support of user community

Milestone Date July 15/19
Cost \$0

Phase Software (backend cloud server-data storage)

Phase Duration Sept 1-Nov 1/19
Milestone Develop back end software to support User App and Version 2 of Firmware
Milestone Date 01-Nov-19
Cost \$38,000

Phase Mobile Application Design & Implementation: User Application Version 1.1
Phase Duration Sept 1-Nov 30/19
Milestone Release Version 1.1 (release 2) to User group.
Milestone Date Dec 13/19
Cost \$40,000

Phase Research Strategy: User Experience
Phase Duration Sept 1 –Nov 30/19
Milestone Create set of revisions driven by user experience
Milestone Date Nov 30/19
Cost

Phase Mobile Application Design & Implementation: Subscriber Application Version 1
Phase Duration Sept1/19-Jan 24/20
Milestone Release #1 Subscriber App including content management and push features.
Milestone Date Jan 24/20
Cost \$85,000

Phase User Feedback System
Phase Duration Nov 16-Dec 13/19
Milestone Build integrated feedback system into User App and Subscriber App.
Milestone Date Dec 13/19
Cost \$0

Phase Doorable Community: Online user-user dialogue/community building
Phase Duration Mar31/20-Mar 1/21
Milestone Fully develop platform for user-user, user-subscriber dialogue on issues, projects, specific issue-based initiatives, project building.
Milestone Date Mar 1/21
Cost \$172,500

Phase Market Research – Subscriber Community
Phase Duration June1-Sept 1/20
Milestone Date Sept 1 /20
Cost \$80,000

Phase Mobile Application Design & Implementation: Subscriber Application Version 2
Phase Duration June 1-Dec 1/20
Milestone Fully develop platform for services to subscribers, including a fee for service model for content management, push services for interested users and a range of content offerings. Licensing options may be available and developed for large subscribers (i.e. GNB)
Milestone Date Dec 1/20
Cost \$60,000

Phase Mobile Application Design & Implementation: User Application Version 2.0
Phase Duration Nov 1/20-Mar 1/21
Milestone Major release of the User app synchronized with the release of Doorable Community.
Milestone Date Mar 1/21
Cost \$55,000

Phase Data storage and processing

Phase Duration Sept 1/20
Milestone Data storage and processing of subscriber data, Open data and User special research data
Milestone Date Sept 1/20
Cost \$42,500

Phase 10,000 Users
Phase Duration Nov30/20
Milestone 10% of Greater Fredericton residents
Milestone Date Nov 30/20
Cost \$0

Phase MRR SaaS: Fully featured Subscriber services
Phase Duration Dec 1/20-Ongoing
Milestone Develop subscriber app features, test/price/deploy
Milestone Date Dec 31/20
Cost \$0

Phase 20,000 Users
Phase Duration Mar31/21
Milestone 20% of Greater Fredericton residents
Milestone Date Mar 31/21 **Cost** \$0

Phase New Market Entries:- 2 new NB cities
Phase Duration Mar31/21-Mar31/22
Milestone Mar 31/22
Cost \$0

Phase 60,000 users
Phase Duration
Milestone Definable percentage of population market in 2 NB cities
Milestone Date Mar 31/22
Cost \$0

Phase 120,000 users
Phase Duration

Milestone Definable percentage of population market in 2nd province adopting the technology
Milestone Date Mar 31/23
Cost \$0

Phase National Reach
Phase Duration Mar31/22-Mar 31/23
Milestone Distribute/sell fully deployed and tested Doorable technology
Milestone Date Mar 31/23
Cost \$0

Doorable Sub -total **\$1,135,000**

Nunavut
(as received)

From: SC / VI (INFC)
Sent: March 7, 2019 12:00 PM
To: [REDACTED]
Subject: Smart Cities Challenge - Successful Final Proposal Submission

Dear [REDACTED]

Congratulations! Your submission is ready to move onto evaluation following a completeness check (per the latest FAQs).

Thank you for your cooperation, patience, and hard work, especially during the past eight months. We are truly honoured to have worked with you and wish you the best of luck in the competition!

On a related matter, we have recently determined that it will not be feasible to post final proposals on the Infrastructure Canada website in a timely manner. Instead, we will take an approach similar to the application stage and publish your executive summary in both official languages on the Infrastructure Canada website with a link to the final proposal on your website. We understand that posting the final proposal on your website is not a requirement contained in the finalist guide so we appreciate your cooperation in facilitating access to your final proposal in an open and transparent way. Please note that the accessibility materials you have prepared for your final proposal will still be helpful in preparing various communications products to promote and share knowledge of your work.

Once you have posted your final proposal on your website, please send us the link if you haven't done so already. If you anticipate that you will be unable to post your final proposal on your website within two weeks, please let us know.

As always, we are happy to answer any questions. The best way to reach us going forward would be at our generic account: infc.sc-vi.infc@canada.ca.

Thank you.

Smart Cities Challenge Team
Infrastructure Canada
infc.sc-vi.infc@canada.ca

COMPLETE CHECK FOR FINAL PROPOSAL

FINALIST: Nunavut				
ASSESSED BY: Amanda Aizlewood				
VALIDATED BY: Alex Long				
APPROVAL BY: select one: Jenny Tremblay / Eric Poirier				
DATE OF COMPLETION: enter date when all completed boxes are checked				
REQUIREMENTS	COMPLETED	IF NOT COMPLETED, NOTE REASON	GUIDING PRINCIPLES	ACTIONS
SUBMISSION				
Submitted to infsc-vi.infsc@canada.ca by 23:59 PST on March 5, 2019	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> No extensions will be granted No exceptions will be made for lateness or technical problems (finalist must be able to show evidence of submission) 	<ul style="list-style-type: none"> # to contact finalist If not resolved, # to flag to DG for decision
Final proposal is submitted	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> No extensions will be granted There is flexibility on the finalist video until the end of the week 	<ul style="list-style-type: none"> Assessor to save everything in designated folders # to contact finalist if anything is missing If not resolved, # to flag to DG for decision
Finalist video is submitted	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> There is flexibility on the finalist video until the end of the week 	<ul style="list-style-type: none"> Assessor to save everything in designated folders # to contact finalist if anything is missing If not resolved, # to flag to DG for decision
Preliminary Privacy Impact Assessment or Preliminary Rationale Analysis	<input checked="" type="checkbox"/>	PPIA	<ul style="list-style-type: none"> No extensions will be granted 	<ul style="list-style-type: none"> Assessor to save everything in designated folders # to contact finalist if anything is missing If not resolved, # to flag to DG for decision
FINAL PROPOSAL				
Written in one of Canada's official languages	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> If the final proposal is submitted in a language other than English or French, a companion version in English or French is required from the finalist 	<ul style="list-style-type: none"> # to extract the executive summary from the final proposal and send it to translation (if a French final proposal, send the entire document to translation)
Generally readable (e.g. picture is not covering text, text are not overlapping)	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> If there are serious formatting issues that hinders readability, the finalist may need to resubmit 	<ul style="list-style-type: none"> # to do a scan of the final proposal and verify that all text and tables, graph, etc. could be read
Text-based and in either MS Word (.doc or .docx) or a fully readable, searchable, and selectable PDF (.pdf) format	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> Finalist may adjust the format for INFC posting purposes after the deadline 	<ul style="list-style-type: none"> # to verify with Comms if format is suitable for posting, given INFC web accessibility standards If not suitable, # to contact finalist
No longer than 75 pages* (Financial chapter exempted) and in 12 point font	<input checked="" type="checkbox"/>	About 1/3 page over the 75 pages; within reasonably acceptable variance	<ul style="list-style-type: none"> Finalist cannot adjust content after the deadline If the text overall is smaller than 12 point font, INFC will adjust and evaluate within the new page count 	<ul style="list-style-type: none"> # to notify finalist if final proposal is over 75 pages # to notify finalist if INFC had to adjust the font and page count

Contains an executive summary	<input type="checkbox"/>	No executive summary is included – it is the challenge statement and then the list of chapters.		<ul style="list-style-type: none"> # to QC and save translated version into the designated folder
Organized by these distinct chapters (not limited to these; not necessarily in the same order): <ul style="list-style-type: none"> Vision Performance measurement Project management Technology Governance Engagement Data and privacy Financial Implementation phase requirements 	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> Finalist must have these chapters Finalist can have more chapters Finalist can change the order of the chapters 	<ul style="list-style-type: none"> If the chapters are not clearly labeled, # to do a light analysis of where the content may be and make a note for the Jury
FINALIST VIDEO				
No longer than five minutes	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> Finalist may cut down the time for INFC posting purposes after the deadline 	<ul style="list-style-type: none"> # to notify finalist if video is longer than five minutes and needs cutting down
Submitted as a file or in a downloadable format	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> Finalist may adjust the format for INFC posting purposes after the deadline 	<ul style="list-style-type: none"> # to verify with Comms if format is suitable for posting, given INFC web accessibility standards If not suitable, # to contact finalist
CONFIDENTIAL ANNEX (OPTIONAL)				
Submitted if and only if required	<input type="checkbox"/>	No confidential annex		<ul style="list-style-type: none"> # to flag with DG if confidential annex is lengthy

Jacaban2, Evalynne (INFC)

From: [REDACTED]
Sent: March 6, 2019 2:07 AM
To: SC / VI (INFC)
Subject: Final Proposal - Nunavut 1/3
Attachments: Nunavut_Final_Proposal.pdf

Hi Team,

This is email 1 of 3 of Nunavut's Smart Cities Challenge submission.

For subsequent communications, you may contact me: [REDACTED]
[REDACTED]

Attached is the final proposal document. I've also shared it with you over google drive.

More soon,

Thanks!

[REDACTED]

--

[REDACTED] **Pinnguaq Association**

www.pinnguaq.com

Jacaban2, Evalynne (INFC)

From: [REDACTED]
Sent: March 6, 2019 10:30 AM
To: SC / VI (INFC)
Subject: Re: Final Proposal - Nunavut 2/3

Hi,

Yes here it is.

[REDACTED]

And here is the script:

[REDACTED]

Let me know if it all works?

Thanks!

On Wed, Mar 6, 2019, 10:23 AM SC / VI (INFC), <infc.sc-vi.infc@canada.ca> wrote:

Hi [REDACTED]

We're unable to download the video from the youtube link. Can you please send us the file (via Google Drive, Dropbox, etc.)?

Smart Cities Challenge Team

Infrastructure Canada

infc.sc-vi.infc@canada.ca

From: [REDACTED]
Sent: March 6, 2019 2:11 AM
To: SC / VI (INFC) <infc.sc-vi.infc@canada.ca>
Cc: [REDACTED]

Subject: Final Proposal - Nunavut 2/3

Hi Again,

Linked here is our video submission.

https://youtu.be/fq-YZU9_xpU

Please let me know if you are able to download it.

Thanks.

ATIA - 19(1)

--

Pinnguaq Association

www.pinnguaq.com

Jacaban2, Evalynne (INFC)

From: [REDACTED]
Sent: March 6, 2019 2:50 AM
To: SC / VI (INFC)
Subject: Final Proposal 3/3
Attachments: PPIA - reviewed.pdf; Letter to Jury.pdf

Hi Again Team,

Attached is our PIA - reviewed today by the Privacy Commissioner of Nunavut.
I have also attached a letter for the jury re:letter of support.

Talk soon,

Thank you,

--

[REDACTED] Pinnguaq Association

www.pinnguaq.com

Jacaban2, Evalynne (INFC)

From: SC / VI (INFC)
Sent: March 6, 2019 4:09 PM
To: [REDACTED]
Subject: RE: Final Proposal - Nunavut 4/3

Hi [REDACTED]

Unfortunately, we are not able to add new documents sent after the deadline to your file for evaluation purposes in order to remain fair to all finalists. We will proceed with the original final proposal document.

Thank you for your understanding.

Smart Cities Challenge Team
Infrastructure Canada
infc.sc-vi.infc@canada.ca

From: [REDACTED]
Sent: March 6, 2019 7:55 AM
To: SC / VI (INFC)
Subject: Final Proposal - Nunavut 4/3

Hi Team,

My sincerest apologies, I forgot to add one letter of support!
It is attached here as a single file, and also added on the final proposal doc (at the end). So sorry about this!

--

[REDACTED] **Pinnguaq Association**

www.pinnguaq.com

[REDACTED]

Madeleine Redfern
President
Nunavut Association of Municipalities
Box 2229
Iqaluit, NU X0A 0H0

March 1, 2019

Dear: Her Worship Redfern

I am pleased to write this letter in support of Katinnganiq, a joint project of the Qaugjiartiit Health Research Centre, Pinnguaq, Embrace Life Council and the Nunavut Association of Municipalities.

The concept of creating spaces in every Nunavut community to give youth opportunities through digital empowerment is intriguing, and has the potential to affect great change. It is especially important to use data and connectivity to support health and wellness with our very young population.

Given Nunavut's remote and vast geography, our communities need to look to innovative ways for youth to learn skills, be creative, and express themselves in a safe environment. We must always be mindful of bridging the past and the present. The ability to provide resources and skills development to support ingenuity that is rooted in Inuit principles is critical for our youth to stay engaged. This project balances all these aspects, and looks at the vital importance of life promotion.

I look forward to hearing more this initiative and its positive effects in all our communities, and ask that you consider this proposal for the Smart Cities Challenge. It has the possibility to help some of our most vulnerable youth.

Sincerely [REDACTED]

[REDACTED]

CC: Brian Flemming, Executive Director NAM

[REDACTED]

**Page 414
is withheld
pursuant to paragraph
21(1)(a), 21(1)(b) and 19(1)
of the *Access to Information Act***

**La page 414
Font l'objet d'une exception totale
conformément aux dispositions de paragraphe
21(1)(a), 21(1)(b) et 19(1)
de la *loi sur l'accès à l'information***

Executive Summary

Katinnganiq: Community, Connectivity and Digital Access for Life Promotion in Nunavut

Challenge Statement

Our communities will implement protective and preventative measures to reduce the risk of suicide in Nunavut, which is ten times the national average, and increase the amount and accessibility of peer support networks, educational resources and creative outlets that promote positive Mental Health to all Nunavummiut.

The Katinnganiq: Community, Connectivity, and Digital Access for Life Promotion in Nunavut proposal is submitted by the Nunavut Association of Municipalities, The Embrace Life Council, The Qaujigiartiit Health Research Centre, and the Pinnguaq Association on behalf of the 25 municipalities of Nunavut. As articulated in our challenge statement, our proposal seeks to increase protective factors to the risk of suicide by increasing the amount and accessibility of life promoting activities, resources and support systems like peer networks, educational initiatives and creative outlets to all Nunavummiut in the expanded field of data and technology.

This initiative will see the creation of a network of both physical and digital spaces that offer opportunities for Nunavummiut to connect and share knowledge with each other, learn skills through culturally responsive educational resources and extra-curricular activities, and to express themselves through creative outlets and safe environments as pathways to mental wellness. We will focus on building on community and individual strengths and capacities by integrating permanent Makerspaces as central hubs for digital and STEAM-based activities that amplify Inuit Qaujimagatuqangit principles such as collaboration, creative problem-solving, and knowledge-sharing; with the goals of increasing protective factors and contributing to social equity with respect to the digital divide in Nunavut.

The purpose of the setting up a network of Makerspaces across Nunavut is to enable and empower youth to embrace the future with confidence, armed with new coping skills and tools, and supported by positive relationships, where youth can build a personal sense of belonging, meaning, purpose and hope through their participation in activities. This initiative will provide safe, nurturing, welcoming social hubs for Nunavummiut that:

- **Provide imaginative and engaging programs:** including recreational, extra-curricular learning and skills acquisition (leadership, technology, interpersonal), the arts (performance, visual, music), traditional cultural/ language activities, peer mentoring, Elder mentoring, and coaching.
- **Leverage digital connectivity** where youth have opportunities to connect within communities and across Nunavut's 25 hamlets, share knowledge with each other and

express themselves through access to digital tools and technological know-how utilizing new telecommunications technology.

- **Integrate community support**, including wellness services, where youth can access social/community services delivered on a 'whole person' basis in Makerspaces.

This model for Makerspaces across Nunavut is focused on providing connected and accessible digital technologies and educational resources that create opportunities for intergenerational knowledge transfer and language revitalization as pathways to mental wellness for youth firmly grounded in Inuit values. In **Chapter 1** of this proposal we outline the evidence and model for our vision; as well as provide justification for the changes that were made during the finalist phase. In **Chapter 2** we outline the governance framework that will provide the platform for achieving the outcomes of this initiative. **Chapter 3** articulates the goals as ultimate outcomes, identifies the inputs and activities in a logic model, shows the KPIs which will be used to measure progress, and illustrates the specific outputs and outcomes for each activity. In **Chapter 4** we outline how the initiative would be implemented and managed, alongside a description of the several work streams, tasks and subtasks. In **Chapter 5** we provide an outline and description of the different technologies that will form part of this proposal. **Chapter 6** provides a description of our approach to data and privacy for the implementation of this initiative, while **Chapter 7** describes the outreach methodology and engagement activities that were undertaken during the finalist phase. In **Chapter 8** we discuss our plans for meeting legislative and policy requirements regarding the duty to consult with Indigenous groups, modern treaty obligations, and the Community Employment Benefits Plan. Finally, **Chapter 9** reports on the finalist grant utilized and provides class B estimates for our projected costs throughout the next five years.

March 5th, 2019

Smart Cities Challenge Jury
Infrastructure Canada

Dear Smart Cities Challenge Jury,

Thank you for the opportunity to present to you Nunavut's final proposal for the Smart Cities Challenge.

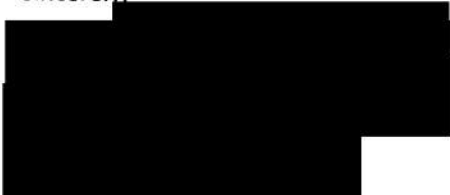
In our submission you will find our written proposal, the finalist video, and our Preliminary Privacy Impact Assessment, which was submitted to the Privacy Commissioner of Nunavut. In a small window of time, the Privacy Commissioner was able to give us good feedback about our preliminary PIA and our proposal in general, which we have considered and included in the documents we have submitted.

At the same time, our proposal also includes several letters of support from Nunavut communities. Though we have verbal confirmation of support from all Nunavut communities through our engagement and conversations over the last few months (including at the Nunavut Association of Municipalities Annual General Meeting), not all the communities were able to submit their letters in time. At the moment of submission, we have written support from 15 out of 24 communities (excluding Iqaluit, whose Mayor is the President of the Nunavut Association of Municipalities, and therefore the lead applicant of this proposal, as well as the host community for the pilot makerspace).

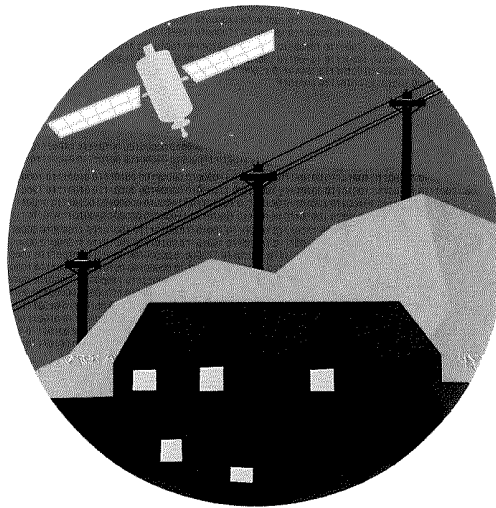
As we wait for the remaining communities to submit their letters of support, we ask that you consider this proposal to be representative of all 25 Nunavut communities, as we have had verbal support, and as the application being submitted by the Nunavut Association of Municipalities, providing a single voice for Mayors across the Territory.

Thank you in advance for your patience.

Sincerely,

A large black rectangular redaction box covering the signature and name of the sender.

On behalf of the Nunavut Smart Cities Final Proposal Team



March 2019

Smart Cities Challenge

Katinnganiq: Community, Connectivity
and Digital Access for Life Promotion in Nunavut

Canada

Government of Canada's Smart Cities Challenge

*A partnership between the Nunavut Association of Municipalities, Embrace Life Council,
Qaujigiartiit Health Research Centre and the Pinnguaq Association*

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Executive Summary

Katinnganiq: Community, Connectivity and Digital Access for Life Promotion in Nunavut

Challenge Statement

Our communities will implement protective and preventative measures to reduce the risk of suicide in Nunavut, which is ten times the national average, and increase the amount and accessibility of peer support networks, educational resources and creative outlets that promote positive Mental Health to all Nunavummiut.

Chapter 1; Vision: This chapter outlines the vision for our proposal and provides the evidence for our vision as well as justification of the changes that were during the finalist phase.

Chapter 2: Governance: This chapter outlines the governance framework that will structure our proposal moving forward and provides a detailed description of its composition and how it will provide the platform for achieving outcomes.

Chapter 3; Performance Measurement: This Chapter articulates the goals as ultimate outcomes, identifies the inputs and activities in a logic model, shows the KPIs which will be used to measure progress, develops the specific outputs and outcomes for each activity.

Chapter 4: Project Management: This chapter outlines how the initiative would be implemented and managed. It will describe the several work streams, tasks and subtasks.

Chapter 5: Technologies: This chapter provides an outline and description of the different technology aspects that are part of this proposal

Chapter 6: Data and Privacy: This chapter provides a description of our approach to data and privacy for the implementation of this initiative

Chapter 7: Engagement: This chapter describes our outreach methodology and engagement activities that were undertaken during the finalist phase.

Chapter 8: Implementation: This chapter describes our plans for meeting legislative and policy requirements regarding the duty to consult with Indigenous groups, modern treaty obligations, and the Community Employment Benefits Plan.

Chapter 9: Financial: This chapter provides class B estimates for our budget costs, it outlines the general budget for this initiative, and reports on the finalist grant utilized.

Chapter 1: Vision

Our final proposal continues to be based on the challenge statement above, yet has departed from our initial proposal by redirecting our proposed activities using a **life promotion** approach to suicide prevention, which is “based on the belief that all young people are capable of finding their own path to a holistic and meaningful life”¹. As defined by the *Together to Live* online toolkit developed by the Ontario Centre of Excellence for Child and Youth Mental Health:

“life promotion efforts are holistic, strengths-based and empowerment-focused. They align seamlessly with recovery-oriented models of mental health care as they aim to honour young people’s individuality and build their resilience through their personal strengths, available resources and relationships with those around them. Life promotion doesn’t focus on reducing suicidality as much as it focuses on cultivating the strongest possible safeguards against it – namely young people’s **sense of belonging, meaning, purpose and hope**. Life promotion also considers the influence of factors such as cultural heritage and values, community resources and support networks in shaping one’s mental health”

As a result, the ***Katinnganiq: Community, Connectivity, and Digital Access for Life Promotion in Nunavut proposal***, submitted on behalf of the 25 municipalities of Nunavut, is a multifaceted and collaborative effort to create both physical and digital spaces that address the digital divide in Nunavut, both in terms of access to improved broadband connectivity as well as in spaces to access to digital tools and literacy curriculum as important protective factors to risk of suicide. Our initiative offers opportunities for Nunavummiut to connect and share knowledge with each other through peer networks, learn skills through culturally responsive educational resources and extra-curricular activities, and to express themselves through creative outlets and safe environments as pathways to mental wellness.

What our preliminary proposal began to articulate as a suicide prevention strategy composed of six distinct categories of activities (Makerspaces, the te(a)ch computer programming curriculum, mesh networks, digital art therapies, mental health and wellness applications, and the 211 Nunavut Application), we now see materializing as a more holistic undertaking, built within a life promotion framework that understands community makerspaces as safe and nurturing social hubs that provide programs, tools, and resources that integrate art, culture, language, and technology; while maintaining mental health as its priority by enabling individuals to find and engage with their own sense of belonging, meaning, purpose and hope.

Our proposal understands the concept of **mental wellness**, defined by the Alianait Inuit Specific Mental Wellness Framework, as “self-esteem and personal dignity flowing from the presence of a harmonious physical, emotional, mental and spiritual wellness and cultural identity”². Additionally, the First Nations Mental Wellness Continuum Framework, developed jointly by the First Nations and Inuit Health Branch (FNIHB) of Health Canada, the Assembly of

¹ “What is Life Promotion?” *Together to Live*. N.p., n.d. Web. 18 Dec. 2018.

<<http://www.togethertolive.ca/what-life-promotion>>

² *Alianait Inuit Mental Wellness Action Plan*. Alianait Inuit-specific Mental Wellness Task Group, 2007. Page 9. Web. 7 Jan. 2019.

<<https://www.itk.ca/wp-content/uploads/2009/12/Alianait-Inuit-Mental-Wellness-Action-Plan-2009.pdf>>

First Nations (AFN), and Indigenous mental health leaders from various First Nations non-governmental organizations, defines mental wellness as:

“a balance of the mental, physical, spiritual, and emotional. This balance is enriched as individuals have: **purpose** in their daily lives whether it is through education, employment, caregiving activities, or cultural ways of being and doing; **hope** for their future and those of their families that is grounded in a sense of identity, unique indigenous values, and having a belief in spirit; a sense of **belonging** and connectedness within their families, to community, and to culture; and finally a sense of **meaning** and an understanding of how their lives and those of their families and communities are part of creation and a rich history.”³

In other words, throughout this proposal we utilize an understanding of mental wellness conceptualized in terms of a whole that balances spirit, emotion, mind, body and culture. As proposed by Dr. Jeffrey Ansloos, an Indigenous understanding of mental wellness contrasts with the standard definition of mental health held by the broader field of mental health practices in Canada; that despite “increasingly integrating culturally grounded approaches to healing within mental health services, [...] fails to consider how Indigenous knowledge may be epistemologically dissonant with mental health paradigms”⁴. Similarly, as proposed by Jennifer White and Christopher Mushquash, “Standard suicide prevention practices which make assumptions about sources of distress and are predicated on models of expert interventions and individualized treatments can sometimes be out of step with non-western, non-European cultural conceptualizations of mental health and well-being. Being culturally responsive means being attuned to local, historical, and sociopolitical influences on mental health and well being, and developing solutions that build on local strengths and address historical and contextual realities”⁵.

For White and Mushquash, a transformative, life promotion approach based on Indigenous values, “is less about implementing discrete suicide prevention programs, and more about **creating the conditions for Indigenous children, youth, families and communities to flourish**, preserve their languages, reclaim their land, recover their cultural and spiritual practices, and exercise their sovereign rights to be self determining, [...] so that they can resiliently pursue lives of dignity, with purpose, hope, belonging, and meaning; and be enabled to realize their full potential”⁶. Similarly, the *Wise Practices* initiative states that “Comprehensive, culturally-based, community-based approaches to life promotion and suicide prevention are known to hold the most promise”⁷.

In the same vein, our approach maintains an alignment with Inuit Tapiriit Kanatami’s National Inuit Suicide Prevention Strategy (NISPS), *Inuusivut Anninaqtuq*, Nunavut’s Suicide

³ *First Nations Mental Wellness Continuum Framework*. Health Canada, Assembly of First Nations, 2015. Page 4. Web. 5 Feb. 2019.

⁴ Ansloos, Jeffrey. *Rethinking Indigenous Suicide*. International Journal of Indigenous Health, 2018. Page 18. Web. 26 Feb. 2019.

⁵ White, Jennifer and Christopher Mushquash. *We Belong: Life Promotion to Address Indigenous Suicide Discussion Paper*. Page 6. Web. 5 Feb. 2019. <<https://wisepractices.ca/wp-content/uploads/2017/12/White-Mushquash-2016-FINAL.pdf>>

⁶ White, Jennifer and Christopher Mushquash. *We Belong: Life Promotion to Address Indigenous Suicide Discussion Paper*. Page 5-8. Web. 5 Feb. 2019. <<https://wisepractices.ca/wp-content/uploads/2017/12/White-Mushquash-2016-FINAL.pdf>>

⁷ “System-Level Change for Life Promotion.” *Wise Practices*. N.p., 2018. Web. 18 Feb. 2019.

<<https://wisepractices.ca/system-level-change/>>

Prevention Action Plan for 2017-2022 as well as with the First Nations Mental Wellness Continuum Framework, all of which are evidence-based holistic approaches which consider the entire lifespan of the individual with a special focus on nurturing healthy children⁸ and creating a framework of support at the individual, family and community levels⁹ while addressing the socio-economic conditions that affect the daily health and wellbeing of Nunavummiut¹⁰ as the most impactful way to ensure that people are less likely to reach the point where they consider suicide¹¹.

These plans iterate on the importance of confronting social and economic inequities, childhood adversity, and mental distress, as well as historical and intergenerational trauma stemming from Canada's colonization of Inuit Nunangat¹² that create environments where risk for suicide multiplies¹³. For Inuit, creating equity "means eliminating unfair and avoidable differences in areas such as housing, education, and access to healthcare in ways that validate our language, culture and identity"¹⁴. As a result, these strategies outline a vision in which individuals, families, communities, organizations and governments work together to provide wide-reaching and meaningful services that are built on the values of *Inuit Qaujimajatuqangit*, the Inuit knowledge system and worldview, to prevent suicide and build healthy communities where children and youth can grow up in safe and nurturing environments¹⁵. Consequently, ITK places considerable emphasis on increasing protective factors and the development of resiliencies in youth through an "upstream" approach, which are those delivered early in life and continue to be protective into adulthood¹⁶.

In responding to the above and maintaining a Smart Cities approach that leverages data and connected technology, our goal to promote life and positive mental health for young Nunavummiut is sought by increasing protective factors and contributing to social equity through community makerspaces that nurture wellbeing while addressing the digital divide in the North. As articulated in our challenge statement, we seek to increase the availability and accessibility of life promoting activities, resources and support systems like peer networks, educational initiatives and creative outlets to all Nunavummiut in the expanded field of data and technology - with a focus on building up community and individual strengths.

Makerspaces offer a gathering space for people to come together to be creative. In the past few decades, makerspaces have become a movement and a culture of individuals "using a mix of digital fabrication, open hardware, software hacking and traditional crafts to innovate

⁸ *Inuusivut Anninaqtuq Action Plan 2017-2022*. 2017. Page 9. Web. 5 Apr. 2018

<http://inuusiq.com/wp-content/uploads/2017/06/Inuusivut_Anninaqtuq_English.pdf>

⁹ *First Nations Mental Wellness Continuum Framework*. Health Canada, Assembly of First Nations, 2015. Page 4. Web. 5 Feb. 2019.

¹⁰ *Inuusivut Anninaqtuq Action Plan 2017-2022*. 2017. Page 11. Web. 5 Apr. 2018

<http://inuusiq.com/wp-content/uploads/2017/06/Inuusivut_Anninaqtuq_English.pdf>

¹¹ *National Inuit Suicide Prevention Strategy*. Inuit Taipiriit Kanatami: 2016. Page 9. Web. 29 Jan. 2019.

<<https://itk.ca/wp-content/uploads/2016/07/ITK-National-Inuit-Suicide-Prevention-Strategy-2016-English.pdf>>

¹² *National Inuit Suicide Prevention Strategy*. Inuit Taipiriit Kanatami: 2016. Page 5. Web. 29 Jan. 2019.

<<https://itk.ca/wp-content/uploads/2016/07/ITK-National-Inuit-Suicide-Prevention-Strategy-2016-English.pdf>>

¹³ *National Inuit Suicide Prevention Strategy*. Inuit Taipiriit Kanatami: 2016. Page 5. Web. 29 Jan. 2019.

<<https://itk.ca/wp-content/uploads/2016/07/ITK-National-Inuit-Suicide-Prevention-Strategy-2016-English.pdf>>

¹⁴ *National Inuit Suicide Prevention Strategy*. Inuit Taipiriit Kanatami: 2016. Page 5. Web. 29 Jan. 2019.

<<https://itk.ca/wp-content/uploads/2016/07/ITK-National-Inuit-Suicide-Prevention-Strategy-2016-English.pdf>>

¹⁵ *Inuusivut Anninaqtuq Action Plan 2017-2022*. 2017. Page 5. Web. 5 Apr. 2018

<http://inuusiq.com/wp-content/uploads/2017/06/Inuusivut_Anninaqtuq_English.pdf>

¹⁶ *National Inuit Suicide Prevention Strategy*. Inuit Taipiriit Kanatami: 2016. Page 25. Web. 29 Jan. 2019.

<<https://itk.ca/wp-content/uploads/2016/07/ITK-National-Inuit-Suicide-Prevention-Strategy-2016-English.pdf>>

for themselves, underpinned by an ethos of openness and skill sharing rather than commercial benefit”¹⁷. Makerspaces are also grounded in a “DIY” culture which embraces creation and sustainability and promotes skill-building and self-directed learning. They grew popular in the United States and Canada in the 1960’s and 1970’s and were aligned with civic and social movements of the time. Makerspaces also encompass an ethos of “hacking”, understood as a practice of taking an object with a specific use and repurposing it; or “hacktivism”, which involves the subversive use of computer programs and networks.

In a deeper way, the concept of hacking as it refers to practices of innovation and adaptation have been deeply embedded in Inuit history and culture for millennia; responding to change and social upheavals with teamwork, creativity, and consensus building. What is commonly referred today as 21st century skills like critical thinking and problem solving, innovation, creativity, collaboration and communication¹⁸ have been and continue to be the very principles built into the guiding Inuit values called *Inuit Qaujimajatuqangit* or “The Inuit Way of Knowing”. These are:

- (a) *Inuuqatigiitsiarniq* (respecting others, relationships and caring for people);
- (b) *Tunnganarniq* (fostering good spirit by being open, welcoming and inclusive);
- (c) *Pijitsirniq* (serving and providing for family or community, or both);
- (d) *Aajiqatigiinni* (decision making through discussion and consensus);
- (e) *Pilimmaksarniq/Pijariuqsarniq* (development of skills through practice, effort, action);
- (f) *Piliriatigiinni or Ikajuqtigiinni* (working together for a common cause);
- (g) *Qanuqtuurniq* (being innovative and resourceful); and
- (h) *Avatittinnik Kamatsiarniq* (respect/care for the land, animals and the environment).¹⁹

We consider Makerspaces as an organic extension of this history and philosophy. Our proposal intends to create spaces for education that support Inuit values and skills like collaboration, creativity, critical thinking and problem-solving, while emphasizing relationships to the land and the environment.

In the article “Making Community: The Wider Role of Makerspaces in Public Life”, the authors identify four broad themes that outline the different roles Makerspaces play in the wider community: acting as social spaces, supporting wellbeing, serving the needs of the communities they are located in, and reaching out to excluded groups²⁰. They understand the potential of makerspaces as third spaces, or multi-dimensional social spaces separate from the home and the workplace that play a critical role in public life²¹. As a result, these spaces can

¹⁷ Taylor, Nick, Ursula Hurley and Philip Connolly. *Making Community: The Wider Role of Makerspaces in Public Life*. ACM, 2016. Page 3. Web. 15 Feb. 2019.

¹⁸ *Ontario 21st Century Competencies*. Queen’s Printer for Ontario, 2015. Page 56. Web. 17 Sept. 2018. <http://www.edugains.ca/resources21CL/About21stCentury/21CL_21stCenturyCompetencies.pdf>

¹⁹ Education Framework: Inuit Qaujimajatuqangit For Nunavut Curriculum. Nunavut Department of Education, Curriculum and School Services Division, 2007. Web. 8 Jul. 2018.

²⁰ Taylor, Nick, Ursula Hurley and Philip Connolly. *Making Community: The Wider Role of Makerspaces in Public Life*. ACM, 2016. Page 35. Web. 15 Feb. 2019.

²¹ *Ibid* page 10 Taylor, Nick, Ursula Hurley and Philip Connolly. *Making Community: The Wider Role of Makerspaces in Public Life*. ACM, 2016. Page 10. Web. 15 Feb. 2019.

have an explicit agenda beyond digital or physical fabrication, intent on creating positive change in a community²².

Our model for Makerspaces in Nunavut is focused on building pathways to life promotion and mental wellness for youth firmly grounded in Indigenous values by nurturing creativity, fostering agency, and building positive relationships while engaging in the expanded field of technology at the intersection of art, culture, science and education. The idea that connected and accessible digital technologies and resources for Indigenous communities create opportunities for intergenerational knowledge transfer, language learning, renewal, and revitalization through multimodal forms as pathways to mental wellness has gained considerable traction in recent years.

A 2013 report titled "Promoting Positive Youth Development and Highlighting Resources for Living in Northwest Alaska Through Digital Storytelling" describes a three year project that used digital storytelling as a health promotion strategy within a Positive Youth Development (PYD) framework. In this project, Digital Storytelling comprised the creation of 3-5 minute videos by youth that reflected aspects of their own life experiences. They selected and generated photos, wrote and recorded first-person voice-over narration, and learned through hands-on computer tutorials how to assemble the materials into a finished digital story²³. The report concludes that "the digital storytelling project offered young people a way to gain a sense of personal mastery and achievement, highlight positive aspects of themselves, their lives and their reasons for living, as well as offering them a venue for strengthening connections with people [...] Digital storytelling presents a promising approach to health promotion and primary prevention that can be used to bolster cultural and identity-based protective factors needed for ushering marginalized young people into healthy adulthood"²⁴. Although in this case digital storytelling is mostly focused on audiovisual techniques and materials, a variety of programs and technologies can be used to tell stories in dynamic and interactive ways, including with coding and game developing software like Twine and Scratch.

In the article "Supporting Self-Determined Indigenous Innovations: Rethinking the Digital Divide", authors Jasmin Winter and Justine Boudreau make a case for the potential of makerspaces as important initiatives that open up both physical and digital environments to project Indigenous worldviews and ways of knowing into the future of technology²⁵. Specifically, the authors outline a case study that describes the efforts of the community of Pimicikamak First Nation (Cross Lake, Manitoba), who, during a state of emergency declared in March 2016 due to increased numbers of death by suicide, reached out to the uOttawa Richard L'Abbe Makerspace and partnered with its sister organization Maker Mobile to develop a strategy to empower Cross Lake youth through community-driven making²⁶. This strategy involved the development of one week summer camps

²² Ibid page 10 Taylor, Nick, Ursula Hurley and Philip Connolly. *Making Community: The Wider Role of Makerspaces in Public Life*. ACM, 2016. Page 10. Web. 15 Feb. 2019.

²³ Wexler, Lisa, Aline Gubrium, Mehan Griffin, and Gloria DiFulvio. *Promoting Positive Youth Development and Highlighting Reasons for Living in Northwest Alaska Through Digital Storytelling*. Health Promotion Practice, 2012. Page 620. Web. 12 Jan. 2019.

²⁴ Wexler, Lisa, Aline Gubrium, Mehan Griffin, and Gloria DiFulvio. *Promoting Positive Youth Development and Highlighting Reasons for Living in Northwest Alaska Through Digital Storytelling*. Health Promotion Practice, 2012. Page 622. Web. 12 Jan. 2019.

²⁵ Winter, Jasmin and Justine Boudreau. *Supporting Self-Determined Indigenous Innovations: Rethinking the Digital Divide in Canada*. Technology Innovation Management Review, 2018. Page 44-45. Web. 10 Jan. 2019

²⁶ Winter, Jasmin and Justine Boudreau. *Supporting Self-Determined Indigenous Innovations: Rethinking the Digital Divide in Canada*. Technology Innovation Management Review, 2018. Page 45. Web. 10 Jan. 2019

for youth that included curriculum on 3D modelling, 3D printing, coding, building structures on a budget, and making 3D printed jewelry, alongside the purchase of a 3D printer for the community - thus providing a source of engagement and a creative outlet for the community²⁷.

Another example of a community based initiative providing a STEAM (Science, Technology, Engineering, Art and Math) based model for exploration is *Wapikoni*, a Quebec-based mobile studio that travels to Aboriginal communities to provide workshops for youth that allow them to master digital tools by directing short films and musical works, through a methodology that develops self-esteem, skills and resilience²⁸. Founded in 2003, their mission is to “combat isolation and suicide among First Nations youth while developing artistic, technical, social, and professional skills; broadcast films and various public awareness issues facing First Nations while enhancing a rich culture, too often overlooked; and contribute to the preservation of First Nations cultural heritage”²⁹

Despite the temporary nature of these programs and the need for further study, the authors channel Dr. Julie Nagam’s research in stating that “thinking about makerspaces in Indigenous communities should mean connecting contemporary Indigenous innovations to makerspace theories, and back to traditional Indigenous knowledge in a circular way that finds the common thread of community wellbeing”³⁰, while further adding that “as community spaces for innovation, makerspaces may serve as a point of discussion for how to encourage, for example, alternative pedagogies and educational practices to connect youth and elders to promote intergenerational knowledge transmission, [...] this could include building equipment for land-based education, hunting, and trapping, all the while encouraging language revitalization”³¹. Both of these examples are initiatives that draw on the strengths of Indigenous technology and innovation, grounded in their worldviews and methodologies, as pathways to mental wellness.

Our proposal builds on this evidence to focus on implementing permanent Makerspaces within each community in Nunavut as central community hubs for digital and STEAM-based activities that amplify Inuit Qaujimajatuqangit principles such as collaboration, creative problem-solving, and knowledge-sharing. At the same time, there is an opportunity to connect community makerspaces to each other and establish an important territorial network for innovation tied to life promotion.

We propose to centralize this network and provide the governance and project management framework for this initiative through the incorporation of a new organization, titled the Katinnganiq Makerspace Network, or KMN (which will be discussed in the Governance chapter).

Our goals are to improve wellness by teaching new skills, increasing self-confidence, improving sense of agency, fostering positive peer and adult relationships, connecting with culture and identity, and providing new creative outlets and nurturing spaces for all Nunavummiut. Curriculum, programs, and materials will prioritize and encourage the use of Inuktitut to support language revitalization.

²⁷ Winter, Jasmin and Justine Boudreau. *Supporting Self-Determined Indigenous Innovations: Rethinking the Digital Divide in Canada*. Technology Innovation Management Review, 2018. Page 45. Web. 10 Jan. 2019

²⁸ “History.” *Wapikoni*. N.p., n.d. Web. 26 Nov. 2018. <<http://www.wapikoni.ca/about/who-are-we/history>>

²⁹ “Mission, Values and Objectives.” *Wapikoni*. N.p., n.d. Web. 26 Nov. 2018. <<http://www.wapikoni.ca/about/who-are-we/mission-values-and-objectives>>

³⁰ Winter, Jasmin and Justine Boudreau. *Supporting Self-Determined Indigenous Innovations: Rethinking the Digital Divide in Canada*. Technology Innovation Management Review, 2018. Page 46. Web. 10 Jan. 2019

³¹ Winter, Jasmin and Justine Boudreau. *Supporting Self-Determined Indigenous Innovations: Rethinking the Digital Divide in Canada*. Technology Innovation Management Review, 2018. Page 45-46. Web. 10 Jan. 2019

Defining Community Makerspaces and Programs

The purpose of the Makerspaces initiative is to enable and empower youth resilience to embrace the future with confidence, armed with new coping skills and tools, and supported by positive relationships. The central focus of Makerspaces is on 'protective factors', where youth will build a personal sense of belonging, meaning, purpose and hope through their participation in activities. This initiative will provide safe, nurturing, welcoming social hubs for Nunavummiut that:

- **Provide imaginative and engaging programs:** including recreational, extra-curricular learning and skills acquisition (leadership, technology, interpersonal), the arts (performance, visual, music), traditional cultural/ language activities, peer mentoring, Elder mentoring, and coaching.
- **Leverage digital connectivity** where youth have opportunities to connect within communities and across Nunavut's 25 hamlets, share knowledge with each other and express themselves through access to digital tools and technological know-how utilizing new telecommunications technology.
- **Integrate community support,** including wellness services, where youth can access social/community services delivered on a 'whole person' basis in Makerspaces.

The above categories include the following series of activities that have been adapted from what was preliminary proposed.

- **te(a)ch Curriculum, Digital Literacy and Capacity Building**

As it concerns digital literacy and capacity building, our preliminary proposal included the te(a)ch curriculum as a deliverable through workshops programmes within community makerspaces in addition to online and digital access. That is still very much the case. As mentioned in our preliminary application, the te(a)ch curriculum is a free K-12 computer science program designed for Northern and Arctic communities in Canada with digital content and materials that are culturally responsive to Inuit, First Nation, and Métis ways of knowing.

The te(a)ch curriculum meshes a core learning focus of computer science fundamentals with game design, animation, and physical activity grounded in cultural exploration. It is a program with benefits that extend well beyond simply teaching "how a computer thinks". The goal is to implement equitable practices in digital literacy initiatives and harness the strength of Indigenous knowledge and ways of being to build agency and ownership in the use of technology as a creative tool in informed, safe, and positive ways. As will be discussed more in the technology chapter, the online launch of this program will take place early in March 2019 - and can be found here by clicking [here](#).

- **Digital Art and Arts and Crafts Programming**

Central to each makerspace is a foundation of arts and crafts programming that stimulate creativity and support each person's talents through skill-building and play. Each makerspace will have the curriculum and capacity for art and crafts based workshops that based in cultural practices and materials. As mentioned in our preliminary proposal, we wish to work on expanding digital art materials and curriculum to support self-expression and skill-building.

The infrastructure and environment of each makerspace will nurture play and experimentation where youth have the tools and knowledge to build and create their own experiences, in their own languages; with the Makerspace, its community network, and governing foundation having the staff and capacity to assist in the production and realization of youth-led projects.

- **Connectivity**

In our preliminary application we outlined the need to open up local communication portals for both youth and communities to connect to each other. Since becoming finalists of the Smart Cities Challenge, we have modified our original proposal from installing and maintaining mesh networks in every community to supporting initiatives like the Arctic Internet Exchange (expanded upon in the technology chapter), which have emerged as tangible avenues to improve connectivity in the North.

In the recent months, the connectivity landscape in Nunavut has shifted, and this change in our proposal has come out of research and consultation with our local networking partners Nunageek Solutions Inc and Nuvujaq into the implementation process of a mesh network within a community. The challenges identified for a hardware mesh (a mesh network with hardware nodes that creates a local area network) include the need for potentially thousands of nodes to create a successful mesh – in addition to making sure that every node has a power source and is installed, monitored and maintained properly – alongside a danger of falloff of nodes leading to area blackouts. As a project with massive logistics and a reduced capacity for IT and networking solutions in each community - the requirements for successful installation, monitoring and maintenance of mesh networks risks inflating and growing costs to the point of unsustainability.

However, in line with the values set out in this proposal, our approach will be to support capacity building and learning for individuals through makerspace programming and curriculum that addresses networking more generally (and mesh networks specifically if desired), alongside the appropriate tools for practice and prototyping – based on the expertise of networking partners Nunageek Solutions Inc and Nuvujaq.

Additionally, a digital platform for the Katinnganiq Makerspace Network (KMN) will be developed with a purpose to connect the community makerspaces and their members to each other to share knowledge, as well as to enable access to tools, resources and ongoing support for aid in building capacity among teachers and youth. This network and platform will support the exchange of ideas and knowledges between communities and individuals.

- e-Mental Health Initiatives

We recognize that in our preliminary application we proposed to develop several e-mental health initiatives. Currently, some of those are no longer part of this proposal. First is the wellness chat, or community chat application system with the aim of enhancing peer support groups and contribute to maintaining communications between individuals. The Kids Help Phone, which operates a 24-7 phone line for crisis and support, recently launched a free crisis text line for Nunavut, making its services more available. This is in addition to the online chat service they also provide. These developments make our proposed chat application seem redundant. Our intention is to collaborate with others and support different initiatives rather than duplicate work³². To complement local health resources like those offered by the Kids Help Phone, we expect each Makerspace to be a connection to local mental health resources through staff trained in ASIST (Applied Suicide Intervention Skills Training) and Trauma informed practice - as well as a direct connection to other resources offered by the Embrace Life Council and local counselling services.

With regards to gamified interventions, the previously proposed localization of the SPARX game is being pursued by York University in collaboration with Pinnguaq Association, yet the source code has recently become proprietary of a private business - licensed to York University for research purposes only. This means we have no ownership over the source code and disqualifying this feature as a viable option to develop within the context of the Smart Cities Challenge. However the potential to build a piece of (gamified) software with the aim to instill Inuit-specific health values for youth through a digital delivery mechanism is still an unprecedented and transformative initiative. Though it won't be integrated as a firm deliverable in the context of this proposal, we expect that by working with youth at community makerspaces, we will workshop the vision for this piece of software, and work collaboratively to develop it as a resource.

As a whole, this initiative employs an evidence-based approach that is built on the feedback we have received from Mayors and community members, as well as from discussion and consensus reached within the collaborating organizations leading this proposal. These processes and conversations are further discussed in Chapter 6: Engagement. Throughout the past few months, the Pinnguaq Association has, as part of this proposal, opened and operated a Makerspace in Iqaluit. The portfolio of the Iqaluit Makerspace programs and events can be found in Appendix A.

Our is an ambitious project, essentially requiring 25 different tailored approaches to makerspaces that respond to each community's strengths and resources, phased out through a 5-year period - attainable through our proposed governance and project management framework, and measured through a culturally safe evaluation framework. We will work with each community to identify the space available and the appropriate agency to implement and manage their makerspace, highlighting a collaborative and community-led approach.

We recognize this is a competition and that only 2 of 10 proposals will be selected as winners in our category. We wish to acknowledge the important work of our fellow finalists - whose initiatives represent important solutions and responses to the challenges faced in their communities. We do not pretend to state that any proposal is more important than another - as each one stands strong and is validated in its own context. What we present throughout this

³² We will however, continue working with youth we began relationships with to mentor and support their practice.

document is a strategy that, based on extensive evidence and consultation, will be best suited to support the communities of Nunavut to implement the system-level changes required to promote and sustain individual, family, and community wellbeing.

Chapter 2: Governance

To achieve its ambitions, the Katinnganiq Makerspace Network (KMN) initiative needs a governance framework based on key guiding principles. The following principles have been identified through community and stakeholder consultation:

Rooted in Inuit Culture

- The governance model must support the unique Inuit worldview derived from language and culture, spiritual practices and relationship with the land within each local cultural context.
- Governance institutions should be built on existing organizational structures and expertise – including government, not-for-profit (NFP), and even private - wherever possible to enable rapid community level project start-ups.
- Youth and Elder voices should be placed at the centre of relationships with stakeholders.

Community-centric approach

- The governance framework must reinforce a community-driven, community-owned approach in creating Makerspaces, with decision-making and delivery authority vested in local communities.
- Local communities must define their specific needs and develop their own customized approaches to programming based on a principles-based, values-driven operational framework that supports flexibility.
- Local governance arrangements need to evolve within the overall governance framework as local capacities are built.
- Communities must have control over any data or research that profiles their community – in terms of control how it will be used and who has access to it.

Platforms for sharing among communities

- Platforms and practices should enable learning and knowledge-sharing across all participating communities, including research and lessons learned in delivering effective programming.
- Capacity and practices should enable communities to derive the maximum potential from existing and new/forthcoming communications capacity and applications.
- Finally, technology introduction must adapt hardware and software to the unique needs and culture of Nunavut communities.

A **values statement** provides a common set of fundamental beliefs for all Makerspaces managers, partners, stakeholders and participants. The preliminary values statement under consideration is the following: *Our work will be guided by openness in adapting new technologies to our Inuit cultural traditions in ways that create safe spaces to build resilience,*

strengthen their cultural and spiritual beliefs and nurture the innovation skills youth need for strong futures.

This values statement and the proposed governance model and framework are built on the unique foundations of governance in Nunavut - where Inuit societal values and principles (IQ) drive development at all levels. Building the self-reliance of people and communities is a government priority and this governance proposal reinforces this priority.

Improved broadband communications will be important to the success of the project and is integrated into the governance model. There is important recent additions in satellite capacity serving the North, and within 3 years the contemplated new satellite infrastructure that is being deployed. This initiative plans to be in the forefront of taking advantage of new telecoms network capacity to deliver its programs.

This technology includes the latest geostationary satellite and the forthcoming low earth orbiting (LEO) infrastructure. Concurrent with the deployment of Makerspaces in communities by this Challenge project will be the development of community data centres. Their operational governance is an important part of this Governance Chapter.

The Katinnganiq Makerspace Network

Governance Framework

A holistic, multi-level governance model is proposed to ensure that internal structures, functions, processes, rules and relationship behaviours are values and principles-driven and are aligned with the direction, strategy and policies supporting Makerspaces. The governance model is community context-driven and multi-disciplinary. Providing options to youth that steer them away from negative behaviours towards positive options for building their own futures and that of their communities require highly integrated efforts. The silos of traditional support approaches simply do not address the 'whole person' in the context of the community and its worldview.

Governance Structure – Territorial and Hamlet Levels

A new organization called **Katinnganiq Makerspace Network** (KMN) will be created as the umbrella organization to serve the 25 hamlets involved with this initiative. It will be formally established as a not-for-profit organization, incorporated under federal law, and charitable status registration will be sought.

Its charter will be to implement the Smart Cities Challenge award and provide the platform for the co-management of Makerspaces in each community. It will act as a capacity-building and coordination support network for the hamlet-based Makerspaces. Its mission will be to provide each local Makerspace in the KMN with the tools, resources and training to support a culture of innovation firmly rooted in Indigenous values.

A unique feature of the governance model is the distributed nature of power across the 25 local level municipalities. It is envisaged that the hamlet or a self-determining delivery organization will be identified in each community, possibly an existing organization to enable rapid start-up. A new local not-for-profit will be created if a suitable organization does not

exist. For the purposes of clarity, these local delivery organizations are referred to **KMN-L (for KMN-local)**.

These organizations will be anchored by some formal indication of approval in principle by the local hamlet municipal authority, e.g. a resolution passed by the hamlet municipality. Then, the local Makerspaces delivery organization and the territory-wide KMN will enter into a formal agreement stipulating services to be provided and conditions to be met.

Thus, the structure will effectively be a 'bottom-up' governance model where the local delivery organization – each KMN-L - will be responsible and accountable for local activity. The delivery organization's governing body would be appropriately mandated; if a new organization is created, a new board of directors (and executive director) would be selected from local leaders in the hamlet³³. The hamlet level NFP entity – KMN-L - will thereby become the "owners" and leaders of the initiative at the local level. Leadership will need to be carefully selected to lead the initiative and emerging leaders supported. Leadership in small communities is stretched, and individuals wear many hats.

The symbiotic relationship between the KMN and the KMN-L is to be a careful balance between them, each playing their respective roles under separate boards. The KMN will seek to harmonize efforts overall and share experiences through common management frameworks and support tools. The KMN will provide model KMN-L governance and business practices, financial and accounting systems, as well as training offerings and HR systems and the like. With improved connectivity and familiarity with communications platforms, sharing opportunities will be enhanced within local Makerspaces (KMN-Ls) as well as across hamlets.

KMN's Governing Board

The Katinnganiq Makerspace Network *governing board* membership will be between 9-15 members and directors will be appointed for four years³⁴.^[1] The KMN board will include local community representatives and some Makerspace executive directors of local delivery organizations, i.e. the KMN-Ls. The development of Makerspaces and KMN-Ls in each community will come on stream over time as communities develop capacity. That should fill some of the KMN board positions. Once there are several Makerspaces, rotating delegates from the executive directors of hamlets will serve for fixed terms and will be drawn from the growing pool of KMN-L executive directors.

³³ It would be good governance for the locally elected hamlet council members not to be on the board of the local Makerspace authority, but in smaller communities with fewer board candidates, it may not be practical to exclude them.

³⁴ It is also proposed that the following Katinnganiq Board Committees shall be constituted - the Executive Committee, a Strategic Planning and Policy Committee, a Technology Adaptation Committee and a Development and Finance Committee. A board auditor will be appointed, supported by internal audit under the Development and Finance Committee. The board governance function will be carried out by the Executive Committee.

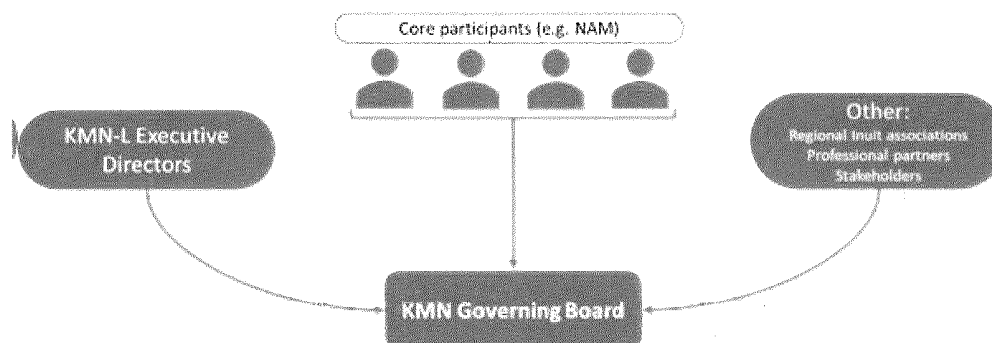


Figure 1: Constituents of the KMN Governing Board

Other members would be drawn from Territorial organizations and key stakeholder groups, e.g., professional, supplier and training organizations³⁵. [1] Regional Inuit associations and the Nunavut Association of Municipalities (NAM) can play representational roles. It is important that board members will be leaders and activists for Makerspaces within their communities and in doing so, will ensure strong connections between communities and KMN.

The board would likely meet face-to-face at least once per year, co-scheduled with the annual gatherings of all the municipal members of the Nunavut Association of Municipalities (NAM). While the board would govern the KMN, it could present annual progress reports to the NAM as to ensure good communication with hamlet governments as an important part of community engagement. The board will operate through communications platforms for other meetings. As shown below, the development of connectivity in response to third party investment in facilities is an important complementary part of the KMN initiatives.

The *board Chair* will be the point for accountability to and liaison with government(s) at all levels on all aspects of the Territory-wide relationship.

It is proposed that a transitional founding board of the 4 core organizations plus an independent interim chair be put in place for six months to one year while incorporation is secured. This start-up measure will ensure rapid building of the KMN governance structure and organization and provide for orderly recruitment of new board members as their key task, in accordance with the articles of incorporation.

Founding members personally will step aside as permanent members, at least in the board's first term or unless invited back by the permanent board. In future, the board chair will be selected by the permanent board members and officers from among its members. Similarly, an interim executive director should be appointed by the transitional board, leaving open the permanent board's prerogative to select its own executive director.

It should be noted that the Nunavut talent pool is small, and individuals serve in numerous ways in their communities. Issues of conflict of interest will require ongoing vigilance. Early policies need to be put in place to ensure integrity of the board and clarity on its duties to the corporation.

The *board's role* is to set the vision, mission and mandate for Katinnganiq. It will set the macro strategic direction, policies and priorities. It will provide planning and resource allocation

³⁵ As a matter of good governance, Government of Nunavut representatives would not be candidates for board positions to represent the GN. However, nothing would prohibit them to be asked to serve on the board as private citizens.

frameworks and allocate resources to communities. The board will develop guidance for engagement and relationships between Katinnganiq Makerspace Network (KMN) and the hamlet-based KMN-L NFPs.

The board will act as *trustee and administrator* for Smart Cities Challenge source of funds. It will commit to dispersing the funds to local municipalities via the incorporated not-for-profit KMN-Ls – or to whatever community organization is to take responsibility for the KMN-L according to local circumstances. Transfer of funds would be as per an agreed formula (beginning with community governance readiness, and taking social indicators into account, e.g., number of youths, social conditions like delinquency rates, etc.). It sets out a system of quality assurance, monitoring and evaluation and reporting by hamlet-based KMN-Ls on their projects/programs.

As discussed in the *Performance Indicators* section, the board will monitor the performance of the KMN organization and hold the Executive Director (ED) accountable for overall performance and compliance on meeting the milestones and accountabilities established for reporting to Infrastructure Canada.

The KMN's binding agreements with the KMN-Ls (i.e., the local level Makerspaces) will include, inter alia, rents, salaries, purchasing and sourcing materials/supplies for the spaces. These agreements will include the operation of the telecommunications platforms, applications software, and computer hardware.

The board will be a visible and vocal advocate in Canada and elsewhere for identifying other sources of funds and partnerships, public and private, to secure sustainability for Makerspaces.

Essential to this relationship is the above initial statement of principles and values that will guide all relationship management relating to Makerspaces. They will empower communities with the flexibility needed to operate within these principles and are derived from and connect to *Inuit Qaujimajatuqangit*.

Advisory Board

The Katinnganiq board will appoint an Advisory Board (AB) to provide counsel on issues, assist in positioning the organization in their networks, and expanding the board of directors' circle of advice to non-Territorial residents. It will be composed of experts/researchers in the fields of behaviour and mental health, social measurement, youth programming, etc.

The advisory board is also a formal way to expand the community engagement network by engaging local community representatives, communications infrastructure specialists, youth, parents, and Elders. Government of Nunavut representative(s) will be invited to participate to facilitate harmonization between Katinnganiq and government policies and programs.

The AB chair and members will be nominated by the KMN board of directors for terms of 3 years. Issues may be referred to the AB, independent reports requested, and strategic insight solicited from it. It will set its own agendas and meeting times. It will be invited periodically to brief the KMN board on issues. It could be invited to provide environmental scanning as part of strategic planning. As an advisory board is discretionary, the number of members and meetings financed will be decided later by the KMN board of directors.

Executive Director of KMN

The Katinnganiq ED will be selected by and reports to the board on implementing its strategy and supporting the board on all matters. The ED should be independent of core organizations and any interested party. However, for the initial founding period, one of the core organizers could be contracted to supply an ED, provided he/she reports to the board.

After the start-up period, a permanent ED will be appointed by the board with the caution that the ED's independence must withstand public scrutiny. However, the core organizations could still be contracted to supply needed expertise, if these contracts are on an arms-length basis. It is important for good governance that any form of self-dealing conflicts of interest are not allowed to grow, even if only through perception. See graphic below that illustrates the basic KMN structure.

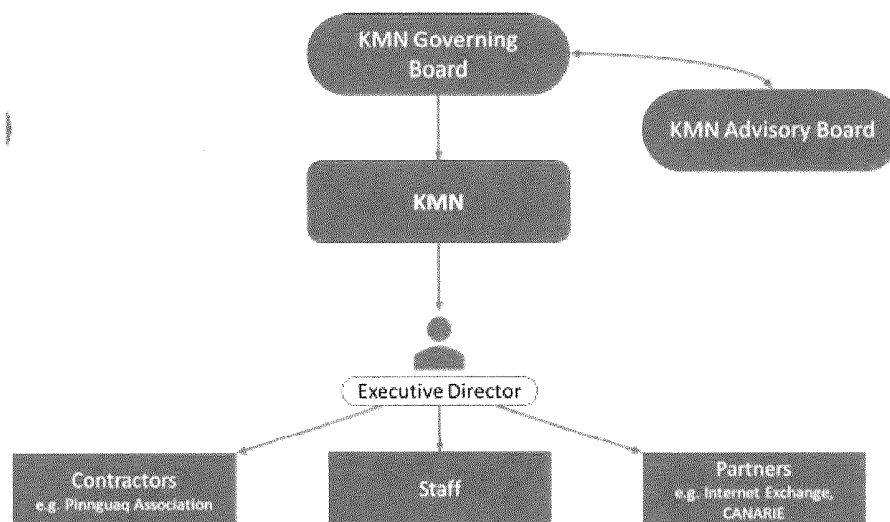


Figure 2: KMN Governance Structure

The board chair will enter into a formal MOU with the ED that lays out all duties and functions, roles and responsibilities, financial reporting and accountability requirements, annual business plan requirements, communications and issues management protocol, shared services, as well as privacy, conflict of interest, records management, audit and evaluation, and risk management. It will also contain terms of employment, compensation, liability and insurance provisions, etc.

It is the responsibility of the ED to lead the overall initiative and prepare reports for funders on the results of all work undertaken. In addition to supporting the board on the above, the ED is responsible for a research program, in conjunction with communities, to ensure that decisions can be taken based on evidence.

The ED advocates for **high bandwidth connectivity** and applications, and the training required for the communities to be equipped by resource people who can operate and maintain the expected data centres that will parallel the creation of community Makerspaces. The ED will work closely with other NFP service organizations and together will help develop capacity at the community level to operate local data centres and other technical infrastructure to fully enable the Makerspaces (the KMN-Ls).

The ED will support territorial authorities as requested (e.g., Arctic College) responsible for connecting the Makerspaces in communities to the CANARIE network (see Technology Chapter). Agreements with NURN, which would be the territorial signatory to any registration with CANARIE, would trigger further investment in broadband facilities to Inuit communities – which would enable more cross community communication as well as interacting with the non-Nunavut world.

The ED **develops and delivers education and learning resources** to support communities in such areas as technology use and development, financial management (bookkeeping), general management and administration, teacher training and curriculum delivery, and leadership development. Training workshops and learning curriculum will be essential to help build capacity for making good use of the KMN support in learning materials, resources, start-up structures, equipment.

Promotion and public communications will be important to broad public awareness of Makerspaces. Such initiatives could include annual or biannual fairs or showcases that showcase youth makerspace group projects.

KMN-Ls as the Local Delivery Organizations

Effective delivery arrangements will be required to realize the ambition of KMN, and they are an essential part of the governance framework. The respective roles and responsibilities of local governments, partners and stakeholders in building this bold new multi-disciplinary, cross-functional model will be clearly set out for the 25 geographically dispersed hamlet communities and Katinnganiq Makerspace Network.

The KMN will develop the frameworks, tools, processes and mechanisms, resources to support a culture of innovation that is firmly rooted in Inuit values. This governance framework includes a similar management framework structured for the needs of the hamlet-based KMN-L level results. Accountability and reporting requirements are central even though each KMN-L partner has its own mandate and accountabilities, culture and internal imperatives and capacities. This means that flexibility is required for individual site innovations, while operating under a common vision, mission, values and ethics and operating principles (see Project Management section).

At the local hamlet level, there will very likely be a variety of not-for-profit organizations who will enter into formal delivery partnerships with KMN and the KMN-L. By community consensus, the KMN-L delivery organization will be organized in the best way to deliver effective local Makerspaces. The expected governance structure is pictured in the graphic below, while Appendix 1 provides an example of the variety of community organizations that already exist in a typical medium sized community.

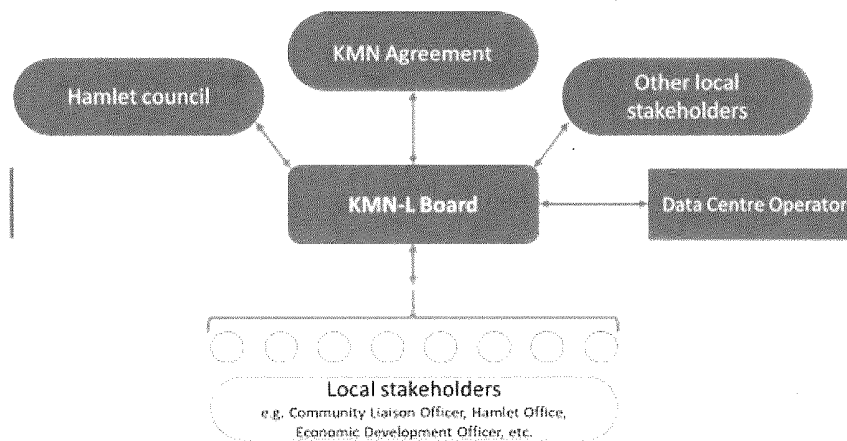


Figure 3: KMN-L Governance Structure

The Program Tools and Processes – KMN will develop tools to assist sites in developing and implementing Makerspace programs and projects. The purpose is to provide generic tools that can be adapted to local conditions and cultures:

- Broad Makerspaces guiding principles, a statement of common values and set of operating principles (to empower local sites with as much program flexibility as possible)
- Program policies and design frameworks
- Fundraising strategies and techniques (modules on achieving sustainability and value for money)
- Operations manual – including baseline operating procedures and sample Makerspace management and administrative structures/ functional responsibilities and arrangements charts, relationship management maps, personnel management including recruitment and development strategies/ generic job descriptions
- Planning, reporting and performance management systems including measurement metrics.
- A menu of generic programs and modules for communities to select from
- Training, development and delivery of programs
- Research and best practices
- Network equipment maintenance, procurement, and replacement contracting templates and procedures
- Agreements and contracting procedures for outside suppliers and NFP donations and services

Local leadership will need to be carefully selected to command the respect and moral authority needed for the initiative to succeed. Emerging leaders themselves will need to be supported by other local stakeholders as well as KMN. Small communities are stretched, and individuals wear many hats. As much as possible, therefore, KMN will work with local institutions and encourage collaboration to ensure the limited capacity in each community will

become part of the Makerspaces – and their companion communications and computer troubleshooting, infrastructure maintenance.

The Katinnganiq Makerspace Network Partners and Stakeholders

Partners and stakeholders play essential roles in the governance model. The governance model recognizes that dynamic participation of local communities, as both partners (contributors of resources) and stakeholders (benefitting individuals, groups, organizations) is essential to the legitimacy and well-functioning of the governance model and outcomes of this initiative. Partners will play formal institutional relationship roles within Makerspaces as they will bring their home organizational insights to the board and Makerspace projects. Stakeholders provide the community opinion and insight as participants in consultations, as volunteers and as participants to steer Makerspaces to address local needs and concerns.

Roles and responsibilities of Core Katinnganiq Partner Organizations

Nunavut Association of Municipalities (NAM) – The group provides a single voice for mayors and municipal administrators of the territory's 25 communities. NAM will facilitate coordination with each community's involvement and help manage KMN's activities through its board position. NAM's day to day relationships with local communities will be indispensable in the communications to and from the local hamlet councils.

The Pinnguaq Association – Pinnguaq is a not-for-profit organization whose mission is to embrace and use technology as a means of unifying and enabling Nunavummiut and Indigenous people in Canada. It has established the Iqaluit Makerspace and developed key program components expected to be adopted by the local Makerspaces, e.g. the Te(a)ch curriculum. Pinnguaq will provide on an arms-length contractual basis support for the activities under the direction of the ED - who will be hired by the board. Pinnguaq's contracted services will embrace technology, training, and organization of the activities to be adopted by the Nunavut communities.

The Isaksimagit Inuusirmi Katujjiqatigiit Embrace Life Council – is a non-profit suicide prevention organization based in Iqaluit. The Embrace Life Council will provide the strategic direction for the development of the proposal in relation to the identified objectives and the need to grow the protective factors that reduce the inclination for youth to harm themselves. It will establish protocols for providing services to the communities, which will be offset by payments to compensate the Embrace Life Council for its services at rates established by the board.

Qaujigiartiit Health Research Centre (QHRC) - The goal of QHRC is to enable health research to be conducted locally, by Nunavummiut, and with communities in a supportive, safe, culturally-sensitive and ethical environment. It also promotes the inclusion of both Inuit Qaujimagatuqangit and western ways of knowing and understanding wellness to address health concerns, create healthy environments, and improve the health of Nunavummiut. The QHRC will continue its research and development of mental wellness resources from a trauma-informed perspective and will offer its services to help structure programs and an evaluation framework of KMN activities.

Relationships with Key Stakeholders and Partners

A mapping of partners and stakeholders with direct and indirect stakes in Makerspaces demonstrates the complexity of arrangements required. As an 'eco-system', all the parties are interconnected with each other in a network of adaptive, interacting organizational partnerships, depending on each other to leverage the transformational change that is essential for survival.

Regional Inuit Associations - These associations fall under the Nunavut Land Claims Agreement as non-profit organizations with roles that span all aspects of Inuit society. They manage land, provide social services, monitor environmental policy, and operate for-profit development corporations that invest in wealth-generating capital.

Hamlets and Service Organizations - Collaborating local organizations and governments will contribute to the cross-functional nature of this initiative. Services are often delivered by separate government and non-profit agencies alike - and their lack of coordination is often to the detriment of youth. This KMN initiative provides an opportunity to integrate efforts and resources locally to benefit youth. The 'whole person' approach to serving youth means that health, social service providers (governmental and non-governmental), recreational organizations, etc. can work together on local programming through Makerspaces.

NGOs and Non-Profits - Churches and other NGOs like education institutions, health organizations, social-serving organizations, arts and cultural organizations, could become supporters and partners with the KMN and with local Makerspaces themselves.

Private sector funders - Funding partners could be afforded the opportunity for representation on boards of local Makerspaces or KMN. Pinnguaq often plays the role of a facilitator, recently with Google's visit to Nunavut wherein Pinnguaq helped the delegation from Google understand how their CS First curriculum fits Nunavut's internet context. Pinnguaq also maintains a partnership with Canada Learning Code which hosts monthly workshops at the Iqaluit makerspace.

Federal Government - The federal government is a key partner and the accountability relationship with it will respond to all terms and conditions of funding. As elected governments are responsible and accountable to citizens for policies and expenditures, this proposal is highly sensitive to this requirement.

Government of Nunavut - GN will continue to play a key role to play in supporting self-governing, sustainable communities that serve the social and cultural needs of residents as it supports Nunavut's economic growth and social, cultural and environmental well-being. Makerspaces will be carefully aligned with policies and programs of the GN.

Other organizations - see Appendix 1 for sample list of local organizations in one sample, mid-sized community.

Community control over data and information

The KMN's purpose will be to connect the community makerspaces to each other to share knowledge, as well as to enable access to tools, resources and ongoing support for building capacity among project leaders and youth. The KMN will include a digital platform to

provide ongoing support for local makerspace, a platform which will evolve as the Nunavut communications infrastructure improves with added satellite capacity.

As noted above, KMN will work with the Arctic Internet Exchange to support the improvement of broadband capacity concurrently with agreements with local communities to establish a Makerspace. While it will vary from community to community, the objective will be to co-locate data centres and Makerspaces, and to arrange for their maintenance. Efforts will be made to ensure the integration of these two activities and organize single teams to manage and maintain the Makerspace and data centre facilities. Doing so will help economize on the draw on human capacity in hamlets and provide more stable and meaningful employment opportunities.

A further network objective will be to arrange for connectivity between each Makerspace and the Nunavut Research Network (NURN)– which will provide the connection to the CANARIE network. To do so will require approvals of the GN and its Arctic College, which would be a recognizable entity for CANARIE. The KMN's Digital Platform will offer be discussed in Chapter 5: Technologies.

Risks

While the core members of the proposed KMN have extensive experience in Nunavut, and in undertaking similar projects, there are always risks which should be identified and mitigation strategies developed. Some of the major risks and appropriate mitigation strategies are identified:

Underperformance on program achievements leads to lower confidence or trust by local stakeholders:

- Provide support to ensure that local decisions are realistic and well-planned for.
- Provide regular stakeholder briefings/updates to ensure knowledge gaps do not develop.
- Ensure that key stakeholders are involved in delivery and advisory functions, particularly youth, Elders and parents.

Local conflicts and consensus hamper progress

- Build formal approval procedures that place consensus at the centre of key decisions.
- Ensure the right stakeholders are at the table.
- Provide training in alternative dispute resolution and if appropriate, establish a veto right of the local organization in event of stalemate on major decisions (when it will get used, how and who will use it).

Concerns over procedural fairness by Katinnganiq Makerspace Network in allocating resources to local communities

- Be transparent as to the criteria to evaluate among different projects and to the process for arriving at the allocation decisions.
- Ensure that key decisions are taken by the board, on the advice of administrative staff – and that if affecting specific communities that the local board is properly consulted.

- Ensure that the board is comprised of the right key individuals capable of taking collective or difficult decisions.
- Establish an Executive Committee of the board that thoroughly examines any issues of procedural fairness and recommends a course of action to the Board of Directors.
- Ensure conflict of interest procedures are established for recusal as necessary.
- Create a board by-law in event of stalemate that provides for a deciding vote.

Delivery bottlenecks caused by local capacity limitations

- Well-planned, practical program/project implementation that takes account of capacity limits and plans accordingly;
- Timely training and development;
- Succession planning so that key skills/competencies can be drawn upon in event of staff turnover;

Crises, and/or other community tragedies draw leadership or delivery attention away from this initiative

- Contingency plans in place early on for rapid communication responses, local spokespersons, etc.;
- Ensure “twinning” of key individuals so that there is always a back-up individual to step into any Makerspaces governance roles in event of crisis or emergencies.

Shortage of financial resources stalls implementation

- Provide a nominal annual budget to communities to support core activities.
- Require clear planning frameworks from communities that manage cashflows.
- Proactive efforts to identify additional funding;

Chapter 3: Performance Measurement

This Chapter sets out the performance measurement model that will demonstrate how Katinnganiq Makerspaces Network (KMN) will be held to account for results achieved in implementing its vision and mission. Measuring results is a key accountability of a board and is the central part of a performance management system. The metrics established to assess whether planned results occurred, and desired outcomes are being achieved are essential to a board's credibility and accountability to its funders, stakeholders, clients and partners.

Performance measurement is part of a broader performance management system with interdependent elements. The responsible and accountable entities are the KMN and the other three core participants – NAM, etc. The local Makerspaces (KMN-Ls) are integral components to the success of the initiative but are not directly accountable to the Smart Cities Challenge program.

Local Makerspaces will be supported by the Katinnganiq Makerspace Network, that provides centralized support, coordination, development and project management tools, communications technology platforms and networks, research and training to Makerspaces. As such, KMN can be viewed both as a key **activity**, as well as a critical **input** to the success of local Makerspaces.

Performance Measurement Challenges

In considering a methodology for performance measurement, the following characteristics were deemed important pre-conditions for this initiative:

- Practical and easily understood performance measurement by the community-level delivery partners, i.e. the local Makerspaces
- Results achievable by communities
- Research and fact-based framework
- Low cost, simple data collection requirements for indicators and measurement tools
- A design that works backwards from the “outcomes (‘ends’) we wish to achieve to the goals we set and activities (‘means’) we do”
- Consistent with the values set out for this initiative
- Priorities-focused (simple, cautious about overreaching and risk of failure)

Our goal is to promote life and provide positive interventions for improved mental health that (i) build capacities for young Nunavummiut, (ii) promote community ownership over Makerspaces, including providing the appropriate physical spaces, and (iii) improve youth access to digital and communications technologies. The major challenge is to link activities to affecting these ultimate outcomes, given that there are so many dimensions and causes for youth capacity, community wellness, and digital acumen³⁶.

Significant research has been undertaken and this proposal builds on known factors that encourage well-being in youth. The National Inuit Suicide Prevention Strategy developed by Inuit Tapiriit Kanatami, lists **six objectives to reduce major risk factors**, while improving major safety and protective factors: (i) *Create social equity*, (ii) *Create cultural continuity*; (iii) *Nurture healthy Inuit children*; (iv) *Ensure access to a continuum of mental wellness services for Inuit*; (v) *Heal unresolved trauma and grief*; and, (vi) *Mobilize Inuit knowledge for resilience and suicide prevention*³⁷. Makerspaces’ interventions will address all of these either directly or indirectly.

In recognizing that suicide is a complex issue, this initiative invests in protective factors through a ‘life promotion framework’ to reduce the risk of youth suicide in Nunavut. Our focus is on creating both physical and digital spaces that offer opportunities for Nunavummiut to connect with each other, learn skills, share knowledge, be creative, and express themselves in safe environments - as pathways to mental wellness. This focus springs from what can be called the **theory of change** – that life promotion in the manner outlined will positively affect the wellness of youth in Nunavut in years to come.

Our approach to **building protective factors**, understood as abilities, skills, and social supports that offer people the ability to cope with stress and spring back from crises and

³⁶ Inuit Tapiriit Kanatami states that achieving social equity with other parts of Canada is necessary to prevent suicide, as is strengthening ‘protective factors’. Of the 11 Inuit ‘social determinants’ of health (Quality of Early childhood development, Culture and language, Safety and security, Education, Availability of health services, Mental wellness, Environment, Livelihoods, Income distribution, Housing and Food Insecurity), a number are beyond the scope of this project (Livelihoods, Income distribution, Housing, Food Insecurity); as for the others, it is important to note that Makerspaces are but one of many possible inputs,

³⁷ National Inuit Suicide Prevention Strategy. Inuit Tapiriit Kanatami: 2016. Web. 29 Jan. 2019.

<<https://itk.ca/wp-content/uploads/2016/07/ITK-National-Inuit-Suicide-Prevention-Strategy-2016-English.pdf>>

trauma³⁸ - lies in understanding the risk factors for suicide in Inuit communities and how they add up to cause distress³⁹. Research states that the risk factors and high numbers of suicide in Inuit communities correlate with the historical trauma from colonial violence, including dispossession, culture loss, and social disconnection⁴⁰. The Inuusivut Anninaqtuq Action Plan states that "Inuit are **not** predisposed by virtue of their ethnicity to be at a higher risk of suicide than non-Inuit"⁴¹; indicating that legacies of colonial violence are the root cause of social inequities that affect Inuit⁴².

Our proposal for implementing digital literacy initiatives as well as improving networking infrastructure and enabling new creative outlets based on technology are **important protective factors** that relate to and are aligned with the above objectives. As defined by authors Jennifer White and Christopher Mushquash, protective factors refer to experiences that "appear to reduce the likelihood of suicide despite exposure to risk"⁴³. Some of the protective factors identified by White and Mushquash as key cultural and institutional practices, can strengthen social relations and promote resilient outcomes for Indigenous communities. They include:

- coping and problem-solving skills;
- experience with success;
- sense of belonging and connection;
- social support;
- interpersonal competence;
- support and acceptance;
- revitalizing language and traditional healing;
- enhancing cultural identity and spirituality;
- enhancing local control and community self-determination;

While there is a challenge to attribute Makerspace activities to the development of protective factors, Makerspaces and their programming in Inuit communities can have some effect on most if not all the factors above; and they can be used as measures to determine impact. Other research on building resilience adds other promising factors, such as optimism, altruism (helping others), faith and spirituality, humor, having a role model, social supports, facing fear, meaning or purpose in life (one believes one has a purpose), and training⁴⁴. All together they represent a sound basis for developing performance measurement indicators.

³⁸ Alianait Inuit Mental Wellness Action Plan. Alianait Inuit-specific Mental Wellness Task Group. Web. 7 Jan. 2019. <<https://www.itk.ca/wp-content/uploads/2009/12/Alinanait-Inuit-Mental-Wellness-Action-Plan-2009.pdf>>

³⁹ *National Inuit Suicide Prevention Strategy*. Inuit Taipiriit Kanatami: 2016. Page 11. Web. 29 Jan. 2019. <<https://itk.ca/wp-content/uploads/2016/07/ITK-National-Inuit-Suicide-Prevention-Strategy-2016-English.pdf>>

⁴⁰ Kral, Michael J. "Suicide and Suicide Prevention among Inuit in Canada." *Canadian Journal of Psychiatry*, 2016. 688 - 695. 3 Apr. 2018. <<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5066555/>>

⁴¹ *Inuusivut Anninaqtuq Action Plan 2017-2022*. 2017. Page 5. Web. 5 Apr. 2018. <http://inuusiq.com/wp-content/uploads/2017/06/Inuusivut_Anninaqtuq_English.pdf>

⁴² According to Inuit Taipiriit Kanatami's *Inuit Statistical Profile of 2018*, 52% of Inuit in Inuit Nunangat live in crowded homes (as opposed to 9% of all Canadians), 34% of Inuit aged 24-64 in Inuit Nunangat have earned a high school diploma (as opposed to 86% of all Canadians of the same age range), 70% of Inuit households in Nunavut are food insecure (as opposed to 8% of all households in Canada), and \$23,485 is the median before tax individual income for Inuit in Inuit Nunangat (as opposed to \$92,011 for non-indigenous people in Inuit Nunangat).

⁴³ White, Jennifer and Christopher Mushquash. *We Belong: Life Promotion to Address Indigenous Suicide Discussion Paper*. Page 6. Web. 5 Feb. 2019. <<https://wisepactices.ca/wp-content/uploads/2017/12/White-Mushquash-2016-FINAL.pdf>>

⁴⁴ "How To Measure Resilience: 8 Resilience Scales For Youth & Adults." *Positive Psychology Program*. N.p., 13 Aug. 2018. Web. 14 Sept. 2018. <<https://positivepsychologyprogram.com/3-resilience-scales/>>

The **conclusions** we draw from research guide our results definition and performance goals in our performance framework. We conclude that most measures of youth well-being require a broader set of indicators than this initiative can practically measure. Many are factors are well beyond the scope of Makerspaces activities and endeavours (poverty, food insecurity, school bullying, overcrowded housing, abuse, etc.). Therefore, we need to blend factors from different research sources that are more directly related to the type of programming local Makerspaces can reasonably provide. It must be recognized that Makerspaces and their activities will be but one input into these complex factors influenced by so many other aspects in the life of a youth. However, the factors selected for Makerspaces will be further vetted by mental health professionals as contributing to youth well-being and focused specifically on building the resilience youth need to adapt to life's challenges.

Finally, it is recognized that building youth resilience needs to be tackled earlier in life. While the main Makerspaces focus is on programming to support the youth experience, we will be exploring complementary programming for young children, for whom "Self-esteem is, at root, a measure of children's judgment of their own worth"⁴⁵. Early childhood learning and child-parent digital literacy are entirely appropriate additions to this initiative, such as the e-learning for K-12. Further culturally relevant extra-curricular digital learning tools will be explored for including children through existing, proven off-the-shelf programs like Aboriginal HIPPY⁴⁶ - which could be brought into Makerspaces as a complementary activity.

Performance Measurement Methodology

This proposal adopts a Results-Based Accountability (RBA) model to assess how the vision and mission are reflected in outcomes. The performance measurement framework below will guide this work:

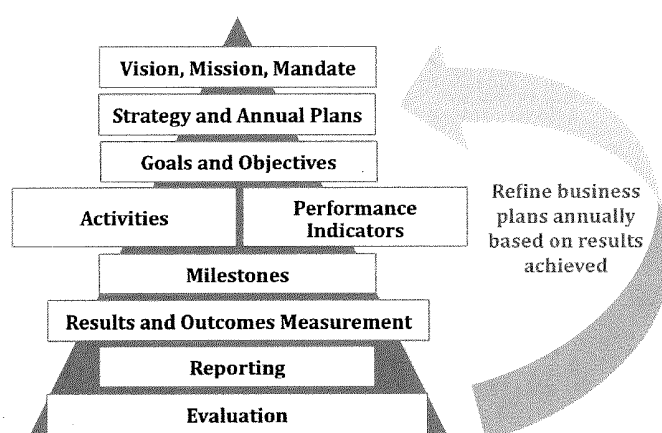


Fig 1: This image illustrates the RBA model

⁴⁵ "Nurturing Children's Self-Esteem Introduction." *MentalHelp.net*. N.p., n.d. Web. 20 Jan. 2019. <<https://www.mentalhelp.net/articles/nurturing-children-s-self-esteem-introduction/>>

⁴⁶ "Aboriginal HIPPY in Canada." *Mothers Matter Centre*. N.p., n.d. Web. 16 Oct. 2018. <<https://www.mothersmattercentre.ca/aboriginal-hippy/>>

From the vision articulated earlier in the Introduction Chapter, RBA begins with articulating desired 5-year outcomes and works backwards to set goals and supporting activities and define key performance indicators (KPIs) where progress can be tracked and measured for success. **KPI metrics** are proposed that focus on three areas:

- the youth experience (improved outlook, participation, and skills acquired);
- how well communities are supporting their local Makerspaces – and vice versa - as a secondary outcome (community support and participation, search for on-going funding, volunteering); and
- progress in learning and utilizing digital skills (adoption by youth, diffusion throughout the community, understanding the value of leveraging data and connected technology in such applications as Indigenous story-telling, culturally relevant games).

The approach of increasing protective factors and encouraging positive social participation through community Makerspaces will both nurture wellbeing while addressing the digital divide in the North. As articulated in our challenge statement, this proposal will use data and connected technology to increase the availability and accessibility of life promoting activities, resources and support systems like peer networks, extra-curricular educational resources, and creative outlets to all Nunavummiut.

Outcomes measurement will focus first and foremost on youth and their personal perceptions of their experiences with Makerspaces. Makerspaces will provide multidisciplinary interventions that focus on the 'whole person', to the extent possible. The observations of Makerspaces leaders and mentors who work with youth are central to measuring progress. And as collective identity is a unique part of Inuit culture, community input will also be important in recognizing success of Makerspaces. Secondly, the performance of communities in supporting Makerspaces will be assessed. Commitment to integrating Makerspaces into communities, engagement through participation, and the ability to secure on-going funding will be included. Finally, the adoption, diffusion, and impact of greater bandwidth access and new digital platforms will be addressed as a third outcome.

It is important to note that performance measurement will not track rates of death by suicide per se as a performance measure due to the multiplicity of determinants. Rather, the '*embrace life*' approach isolates certain variables that do ultimately contribute to social equity. Building youth capacities is the central purpose of Makerspaces. Therefore, outcomes measurement needs to adopt a personal approach where the life of every individual youth is honoured in the calculus of impact.

Assessment measures of change recognize that **social change will occur only incrementally over time**. Measures adopted will not specifically address the standard short, medium- and longer-term perspectives, but rather identify Stage One, Stage Two and Stage Three outcomes. This approach is proposed because length of time may not be the best measure of the *effect* of the outcome. As well, long-term outcomes are likely beyond the scope of measurement in terms of Makerspaces ultimate impacts on social equity. That would take the development of a longitudinal data base extending over generations of youth – which may well receive support and be implemented but is beyond the scope of the Challenge's program.

This initiative is ultimately about **strategic change and a change management** approach needs to be built into the strategic plan. Employees, contract personnel, leaders, partners and

stakeholders as well as organizations in general need to be equipped to understand and manage the changes that are occurring. Tools, processes, understanding respective roles and interrelationships, and excellent communications about the change process are essential to good management of change. Different ways of doing things or seeing can be threatening to some people and sensitive leadership is needed to allay concerns and recruit champions of change. A formal change management team can be identified and change champions such as vocal parents, articulate youth, other community leaders can help 'walk the talk' within communities to actively keep supporters on side.

Identifying change and drivers in the external environment is a starting point for strategic planning. An environmental assessment can provide a baseline starting point to describe the current situation assessment from which planning will evolve and the factors likely to influence future efforts. It should be noted that due to the staged implementation of Makerspaces in the 25 communities, each will proceed on its own pace due to local circumstances.

The Goals and ultimate outcomes

Makerspaces goals proposed follow the 'SMART' rules of being specific, measurable, attainable, relevant and time-specific. Below is a table of our three overall goals and ultimate outcomes. The outcome is a five-year and beyond state of being that Makerspaces aspire to:

Overall Goals		Ultimate Outcomes
Youth are active in Makerspace 'life	➡	Capable Youth
Communities support well-run Makerspaces	➡	Permanent, connected, safe Makerspaces
New digital technologies are effectively used	➡	Reduced digital divide for youth

Project activities and Links to outputs and outcomes

Activities and their inputs and outputs are linked in an integrated manner as illustrated in the graphic below. The goals will be achieved through effective implementation of the workplan for the initiative as well as a constant attention to whether the outputs are driving the targeted outcomes.

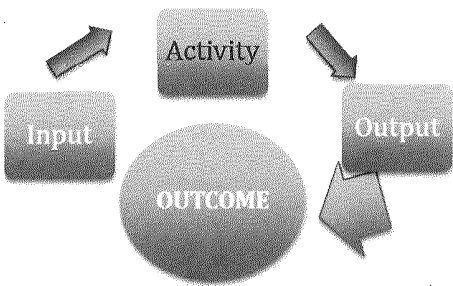


Fig 2: This image represents the input, activity, output, outcome cycle

The Makerspace programming menu adapted from the activities proposed in our preliminary application is described in the Vision Chapter, some of which are further elaborated on in the Technology Chapter. These activities will leverage the benefits of data and connected technology whose operations consist of further activities to be measured. They have been reviewed and revised in response to the feedback received at the Nunavut Association of Municipalities (NAM) AGM.

The Key Performance Indicators

Key performance indicators (KPIs) are presented below and follow the three goals and activity categories identified above. Both qualitative and quantitative KPIs can be constructed from the ones below, as long as data records are kept, and other indicator data are collected and made readily accessible for analysis. As noted above, while data is available regularly – even monthly in many cases – some long-term outcomes can only be shown long after the early participants have been through the program.

Outcome - Capable Youth

Youth capabilities will be measured and assessed through observation, assessment tools, questionnaires and one-on-one interviews, descriptive reports, participant observation, survey evaluation, sharing circles, journaling and voice/video recordings. As well as these more formalized processes to gather input, each KMN-L will be encouraged to establish a “youth council” or some other way for youth to channel feedback as to the effectiveness of the local Makerspaces.

A Personal Growth Chart will be prepared for each participant, the contents of which are a joint project between the Makerspace leader or designated mentor and individual youth. Although data and information will be stored in local data centres, it will be strictly subject to privacy rules. The Growth Chart will use the following indicators and measurement approaches as follows:

Indicators	Measurement
Has acquired new skills and activities	Engages in program activities; Expands number of activities engaged in; Shows proficiency in new skills – coping, technology, language, technology skills; Excels in one or more activities; Has career goals
Has a role model or mentor(s)	Seeks out help and support Listens to Elders/other role models
Established new social connections	New friends and peer groups Participates in communities of interest Participates in peer circles

	Intergenerational connections to work with Elders
Has a strong sense of belonging to the community	Participates in traditional cultural and language activities, including storytelling and games
	Participates in community affairs
	Exhibits leadership
Has a positive self-identity	Optimism for the future
	Good self-esteem
	Pride of self
	Feels empowered
	Expresses opinions and speaks out
	Demonstrates self-confidence
	Good eye contact
	Care in personal appearance
	Can define personal values
Perceived progress overall by community	Multiple perspectives: Elders, youth, community leaders, parents, academic institutions, hamlet, teachers

Outcome - Well-run Makerspaces actively supported by communities

Local Makerspaces will be developed through extensive consultation with each community, and community buy-in is a necessary condition to succeed. For the program to succeed, the Makerspaces need to be supported by their communities. At the same time, the way to do this for the Makerspaces is to support the communities – it is a two-way street. KPIs will be developed from the following indicators and measurement approaches:

Indicators	Measurement
Financially self-supporting	New business partners come on board with firm, planned commitments in cash and in kind
	Alternate sources of funding identified and funding streams in place
	Sound funding projections in place to sustain Makerspaces when federal funding ends
	Growing numbers of active community volunteers, partners and stakeholders and participating youth

	Makerspaces established in all 25 communities
	Meets or exceeds evaluation criteria
	Positive public reports' feedback (exit survey from public presentations)
Increase in community volunteers, partners and stakeholders and numbers of participating youth	Number of youth attending programs at each space, broken down by activity
	Number of volunteers
	New funding/program content partners
	Active community stakeholders on advisory committees, in community consultation sessions
Makerspaces established in 25 communities	Orderly start-ups based on a readiness assessment framework
IMAGINE Canada accreditation of KMN	Plan for certification of good management

Outcome - Effective Use of New Technologies:

The focus is on youth utilization of information technologies, but as they are also members of communities and as their communities are committed to their well-being, of support, measures will include community adoption as well. For example, Elders will learn alongside youth, community data centres can have other uses, and technological learning can be infused as part of a local community's culture. Indicators and measurement approaches proposed are shown in the following table:

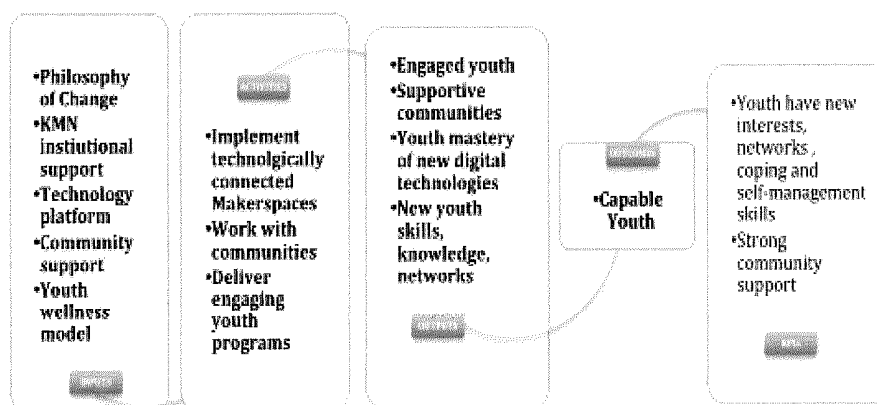
Indicators	Measurements
Digital literacy and Learning Practical Skills	Availability of extra-curricular learning tools and resources
	Accessibility of material in Inuktitut
	Offline and Online Accessibility
	Relevance of learning curricula to users
	Relevance of learning tools to users
	Digital art and creative software/applications
	Connection to culture and traditional knowledge
Reduced digital divide	Improved strength of network infrastructure: <ul style="list-style-type: none"> • Reduced latency • Increased local traffic

	Internships and job opportunities in technology
	Digital literacy and Learning Practical Skills
	Digital art and creative software/applications
	Active and positive participation in social media
	Greater creativity in using digital art, games, and story-telling
Increased opportunities to learn and share knowledge, ideas, and know-how	Skills in team working and adopting different roles
	Reverse teaching of digital skills to the elders
	Improving skills in trouble shooting and self-initiative
	Supporting the community through other applications
	Sharing skills, knowledge with other Makerspaces

Logic Model

The following images and tables represent the logic model for this initiative, drawing on the KPIs discussed above and the main work streams for the initiative (see Project Management Chapter). As such, they identify the **inputs**, **activities**, **outputs** and their **KPIs**, and the **outcomes** and their **KPIs**. As noted in the instructions to bidders, while these tables present the approach that best fits this initiative – with outputs and outcomes matching each activity - we have respected the requirements for the Performance Measurement Chapter. They are high level and individual KPIs at a more detailed level would be developed from the indicators listed above.

The macro evaluation logic model is presented below:



This image represents a Makerspace MACRO input-output model

For a list of milestone, deliverables, timelines and payment schedule, **please see the section on work streams and work breakdown structure and in Chapter 4: Project Management.**

Inputs	Activities	Outputs	KPIs	Expected Outcomes	KPIs
Activity Focus: KMN Start-up and Operations					
Application participants and pro tem core board members of KMN	Set up Physical Office	Lease signed, network hooked up; publicized move in	Documents for lease, operations Media coverage	High awareness generated for program launch	Positive broad reaction in Nunavut
	Assess capacity and create roll-out plan for communities	Capacity assessment template and system; relevant data acquired; realistic roll-out plan prepared	Accuracy of the data and hamlet assessment	Sets a model for rest of program life, although updated regularly	Accuracy in judgment of communities selected
Local community institutions and leaders	Engage with hamlets and gain commitment – agreements struck	Outreach to all hamlets Listen and revise approach Negotiations with reps from hamlets	Introductory communications to all 25 hamlets MOUs with some hamlets	Positive rapport struck with at least half the hamlets	At least 2/3 of communities show strong interest
Challenge program officials	Negotiate Charter with Challenge Program	Signed contract with performance measurement system and payment schedule by deliverables	Satisfies KMN's cash flow requirements Realistic deliverables	Good communication and rapport established Data capture, reporting practices & established	Initiative operating smoothly with trust relationship
Professional and technical suppliers and stakeholders	Constitute, staff, and incorporate KMN	Interim board, ED, and key staff and register non-profit incorporation	Individuals appointed and incorporation documents submitted	Board and staff model broadly lauded, and operate effectively	KMN starts on the right track ascertained by stakeholders
	Establish KMN operational systems	Put in place office systems, staffing, technical plans, Makerspace packages - complete with support guides for Makerspace space, training, and local organization documents	Installed systems run smoothly Training completed for implementing KMN-Ls	Meet early milestones in creating KMN-Ls with sustained positive hamlet relationships	Positive reactions to the nature of the KMN-KMN-L relationships

Inputs	Activities	Outputs	KPIs	Expected Outcomes	KPIs
Activity Focus: KMN Content Development and Distribution Platform					
Apply te(a)ch to Platform	Establish initial programming and connectivity plans (e.g. te(a)ch)	Plans with targets and budgets for staging agreements with communities	Plans accepted and implemented	Well-functioning of programming with broad acceptance at youth and community	Number of communities within acceptable success parameters
Leverage te(a)ch Curriculum	Deploy programming to each participating hamlet	Instructors trained and learning, participation programs launched with full retention of youth participants	#s of youth users retained, good satisfaction score Activities deemed relevant by youth, Elders and community Usage growth and interest results	Programming is well received and effects being effect throughout the community and its youth	Highly satisfactory evaluation of program delivery and personnel competence
Train programming directors and technical support	Deploy technical facilities to each participating hamlet	Networks and data centres established, maintained	Schedule and level of detail reporting meets requirements	KMN-L leadership in well-functioning connectivity spurs wider community improvements	# of Makerspaces considered indispensable hubs for community
	Assess/evaluate program and build for sustainability	Program start-up, annual plans for revisions, add-ons Data collection and evaluations undertaken	ED, instructor reviews, youth feedback, community feedback, and KMN-led reviews with main stakeholders	Sustainability plans developed and implementation occurs throughout the program	Impact data indicates success as well as ongoing budget viability
	Develop Elder-Led Curriculum Develop Adult learning curriculum Deploy new programming and updates	New curriculum modules for adult and elder-led Produce updates for all modules according to feedback and regular reviews Distribute to affiliated KMN-Ls	Agreement on operating model, staffing, payment terms and successful roll-out with few outages	Overall combination of programs meeting goals of initiative, at least in the learning materials and their delivery	Community, youth, instructor evaluations of content and delivery effectiveness
	Develop Arctic Internet Exchange program Roll-out IXP and data centre program	Acquisition of equipment, contract with technical services and support local installation with maintenance services		Bandwidth infrastructure considered a great asset for the KMN-L and whole community	User and operational metrics and community satisfaction measures

	Train, recruit for follow-up years	Training through on-site and online training in the community and centrally	Cost-benefits in terms of quality and retention of trained staff	Upgraded work force throughout Nunavut for this kind of curriculum and technical elements, and Makerspace management	Operational performance of Makerspaces, community satisfaction and youth achievements
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Inputs	Activities	Outputs	KPIs	Expected Outcomes	KPIs
Activity Focus: Manage Local Site Operational Start-up					
KMN advice and support	Build management & accountability structures	Functional offices & management structure	Documented policies and organizational responsibilities	Effective leadership and working relationships	Government & community confidence in KMN-L
KMN systems support	Operationalize reporting and financial management systems	Quarterly performance & financial management reports	Timely quality data that is accessible to the designated users	Accountability for results achieved	Project Charter requirements met on a year by year basis
KMN broadband connectivity requirements Staff training	Install, maintain broadband infrastructure	Advanced broadband activated in Makerspace	Timely installation, training and little downtime	Skilled support staff advance community digital literacy	Transferable skills open up new opportunities
Pilot-test new youth programs	Administer pilot tests to new programs	First cohort pilot tested and lessons learned	Reviews conducted and curricula revised as necessary	Responsive programming New elements added systematically	Satisfactory youth exit survey & parent-Elder feedback
Consultations, information material / meetings & public reporting	Manage Community Relationships	Committed and engaged community	# orgs and individuals actively involved	Long term community support	Active board & advocates; ownership for future by community
KMN support for local Privacy systems	Privacy regime established for local data	Effectively protected personal and community information	Adequate data collection, and guarded distribution practices	Trust and support of data collection and its use	Community and individual confidence in privacy protections

Inputs	Activities	Outputs	KPIs	Expected Outcomes	KPIs
Activity Focus: Deliver Youth Programs and Activities					
Promotion activities, word of mouth	Recruit / enrol target youth	Broad youth participation	Yearly enrolment increase	All target youth are reached & involved	Youth join as a normal part of development so no one left behind
Trained, enthusiastic, committed instructors Mentoring guides and guidelines	Operate programs and activities: • te(a)ch extra curricular learning • Peer circles • Elder mentoring and traditional language / culture revitalization programs and projects • Recreation • Creative arts • Leadership training	Engaging programs and activities Stronger links to traditional culture and language; new 'interest-based' youth mentors Programming reaching at risk youth	Enrolment increases and expanded # of activities and interests Satisfied youth and parents Active program participation	Development of more capable youth	<ul style="list-style-type: none"> • Assumes leadership • Active, vocal participation (<i>attendance</i>) • Acquires new skills and interests • Has a role model or mentor(s) • Establishes new social connections • Takes pride in personal appearance • Exhibits altruistic behaviour • Exhibits new self confidence Δ
Personal Growth Charts as prepared by program leaders, mentors, health professionals	Document progress jointly with each youth	Record of new skills, know-how, coping mechanisms, knowledge, relationships, participation, networks	Measurable new skills, interests, knowledge, know-how, coping mechanisms, relationships	Improved youth awareness, acceptance of self, focus on community, & care for future	See above attributes of successful outcome

Δ Assessed through (questionnaires, interviews, observation; assessment of Personal Growth Charts)

Monitoring, Reporting, and Evaluation

Project Monitoring: This activity will be on-going throughout the 5-year initiative. Monitoring will include data reviews to ensure quality and consistency. It will include client surveys to gather information on the youth experience to make necessary improvements. If early interventions such as additional training are necessary, the monitoring system will pick up such clues through the data collection system. Public meetings are another format that will be utilized on a regular basis that can serve, among other purposes (open communications, stakeholder engagement and consultations), as input to program refinements.

Midterm Progress Assessment (year 3): A more formal external assessment is planned just past the midterm to determine how the initiative launch is shaping up, and to identify issues that need to be addressed in the latter half of the program. Any unidentified risks will be worked back into the project framework. Feedback and more qualitative insights are sought as definitive results will not be evident at this early stage. The purpose is for internal learning and course correction.

The Summative Evaluation is the final, comprehensive impact evaluation which would be carried out by government or by an independent 3rd party at the end of the initiative. As this proposal is confident of on-going sustainability, this evaluation will also be used by Makerspaces to provide guidance to the post-government phase. This evaluation would examine goals and outcomes to determine how well public dollars were spent, whether and to what extent goals and objectives were met and desired outcomes achieved. It is designed to report publicly and for government auditors to address value for money.

Such evaluations are data driven, focusing on the inputs to activities implemented and outputs from them. By definition, this is a medium-term evaluation as longer-term impacts will not likely be visible for several years after the evaluation. Summative evaluations are often used to refine future government interventions and to contribute to the public knowledge and research base for future programming and policy development. The more immediate public to which this initiative is accountable is the local community and this evaluation will be of great interest in the communities and accountability will be rendered there as well about successes and shortcomings. The logic model described in the tables above provides an initial framework for this evaluation, which will be updated according to how the initiative progresses.

Data requirements and collection: Pre-evaluation is sometimes undertaken to get a clearer baseline picture of the state of affairs. However, as there is already sufficient existing population data on the disadvantages in the North, this initiative will instead focus on pulling together **baseline data** and information profiles of communities that line up, to the extent possible, with planned activity inputs and outputs. For example, the number of youths already engaged in recreation or other community activities such as after school programs; numbers of youth with laptops, hours spent on the internet, etc. This review can form part of an 'environmental assessment' which should be undertaken as part of the start-up activities. Such an assessment will provide an opportunity for everyone to understand the environment, challenges, opportunities and risks to the initiative.

Annual audited statements (see Finance Chapter) can also look at value for money, integrity of financial systems and expenditures, risk management, internal controls and the effectiveness of governance. Business processes can be examined for consistency across communities.

Public reporting is an essential part of good governance. An annual report by KMN will be produced that summarizes progress in all the communities. Clearly these reports will be more qualitative in the earlier years. It might use youth attitude surveys and stories to convey how the initiative is unfolding. However hard data on numbers of youth involved, program activity outputs, community participation, will also be included.

One final initiative that the proponents of this initiative are committed to is the creation of a **longitudinal database** that will allow tracking of youth participants through life over a longer period of time. Such data will be important information for Inuit society where the belief is strong that decisions and activities today should result in a sustainable world for future generations. KMN will seek out separate research funding apart from Makerspaces to help design the project so that data systems can be designed at the outset to track individual progress and store additional data. Patterns and trends over a longer period of time are important to addressing fundamental societal issues associated with death by suicide. Inter-generational trauma can take generations to overcome and it is important that Makerspaces not be treated as a one-off initiative. Governments are also interested in replicability when public funds are invested. The Makerspaces model is also relevant to Indigenous communities elsewhere in Canada where rates are also high.

Evaluation Plan

This evaluation plan applies a participatory framework - a method which prioritizes collaboration between researcher and community members through joint planning, implementation, and presentation of the evaluation plan. This participatory framework is focused on collaboration for the continuous adjustment of the program to better meet its goals, and "to improve research protocols by incorporating the knowledge and expertise of community members"⁴⁷. Throughout our plan will be a focus on process at the same time as results, creating opportunities to integrate feedback, and reflection in responses to lessons learned. This evaluation plan will be governed by the KMN board (which will include local representatives from each Hamlet as well as leaders from territorial organizations), and further

⁴⁷ Qaujigiartiit Health Research Centre. *Pathways to Mental Wellness for Indigenous Boys and Men: Movember Project Report*. 2018. Web. 10 Jan. 2019.

developed and implemented by QHRC in collaboration with each hamlet and local delivery organization. In response to the core values of this initiative, the evaluation plan will be:

- **Community-led:** Embrace self-determination through participatory action research and the KMN governance model
- **Strengths-based approach:** work alongside and in consensus with individuals and communities to identify indicators that measure strengths to promote life and wellness through time.
- **Grounded in Inuit Knowledge:** Important that the approach is Inuit specific, holistic and positive; that it supports language and cultural capacity, where the role of Elders and young people are acknowledge and reflected in the development of indicators⁴⁸.
- **Capacity building and sustainability:** Foster autonomy and develop capacity for evaluation in the community.
- **Knowledge-sharing and collaboration:** work in partnerships with community, its members and organizations.

Data Collection and Use

Finalizing the indicators selected and clarifying exactly how they feed into medium term outcomes will require extensive community discussions, given the importance of community ownership of its own data and the story told from that data. Assumptions about data collection need to be recorded as a fundamental part of data partnership arrangements within the project management Charter so that there will no misunderstanding regarding expectations and so that any data/system limitations can be addressed early.

Aggregated data at the territorial level is essential to success of the initiative and for accountability back to the federal government. Privacy considerations will, of course, need to be addressed. Personal data will be subject to strict confidentiality rules [see Data and Privacy Chapter/PPIA].

The timelines established for local data collection need to be firmly part of the Charter partnership arrangements in order to meet quarterly reporting to funders. Funding holdbacks will be used to structure reporting in, if necessary.

Data will be collected on a mandatory basis, aggregated and reported into a central electronic database. Data will then be interpreted to assess if goals and milestones are being met. Collecting both qualitative and population or service data at local delivery points will require simple, easy to manage tools. Care will be taken to keep the data reporting system simple and training will be provided. Local Makerspaces leaders will need software to record and interpret behavioral cues as they occur on site to track youth progress in achieving wellness. Leading edge social measurement tools will be utilized through tablets with pre-loaded frameworks and data collection categories so that low literacy or language translation barriers are not deemed impediments.

Interpreting data will result in performance benchmarks over time to create standards of performance. Comparative data will be available by Year Three. Disaggregating data based

⁴⁸ *Alianait Inuit Wellness Framework*. Web. 5 Dec. 2018.

on a small population will be a challenge and care will need to be taken not to assume trends from this data too early.

Performance management software will have to be purchased to enable data entry, storage of information in a structured way, and to provide output information. Software capabilities needed will likely include survey capability, individual case management, a central data storage hub, and data analysis. Ideally the ability to track relationships with partners and stakeholders would be included. System capacity must be able to include qualitative data (observation, attitude surveys, beliefs, values, fears) and quantitative data (services use, population comparisons with other Canadians) to demonstrate progress and measure change. An example of possible software is Efforts to Outcomes (ETO).

Risks

Risk	Description	Action
Project Management		
1. KMN and/or KMN-Ls fall behind schedule	Outcomes and funding milestones are not met	<ul style="list-style-type: none"> • Early warning project mgt schedule already in place. • Build flexibility into timeframes for unanticipated events. • Early alerts to funders for possible schedule changes
2. More extensive training is required than planned	Inadequate skills to do the job	<ul style="list-style-type: none"> • Corners cannot be cut on training. • Selection of staff must focus on ability to achieve learning proficiency required.
3. Different data systems lead to uneven and non-comparable data	Established local organizations may have their own data systems and the challenge will be to collect and collate uneven data from a variety of sources.	<ul style="list-style-type: none"> • Extra technical support in Year One, including provision of standard, simple templates • Good training essential to data integrity – • Up front investment in getting the KPIs is required • Pilots can help refine KPIs if necessary • Flexibility needed to amend as required
4. Data interpretation – qualitative and quantitative	Danger of interpreting meaning in small numbers; challenge to interpret qualitative data	<ul style="list-style-type: none"> • Good training toward data interpretation reliability • Avoid over reliance on early data interpretations for a small Nunavut population
5. Data integrity	Data will likely be managed by generalists, many with little or no	<ul style="list-style-type: none"> • Simply designed coding inputs • On-going support and coaching • Good training and refresher courses

	knowledge of data collection and systems	
6. Cost of data collection systems	Quality data and information are essential to measuring progress	<ul style="list-style-type: none"> • Build on existing hamlet data collection and information systems to the extent possible • Less than perfect data and information are often a reality with cost trade-off
7. Hamlets are late submitting data	Flexibility is needed due to unforeseen circumstances, but persistent lateness presents a problem	<ul style="list-style-type: none"> • Examine overall progress, as lateness in reporting is often symptomatic of problems or inconsistencies in delivery • If persistent, resort to funding holdbacks
Mental Wellness Model		
9. Comprehensiveness of wellness model and complexity of mental health issues	Mental wellness is a complex issue and there may be differing views on appropriate approaches	<ul style="list-style-type: none"> • Mental health professionals will be asked for input to further identify appropriate protective factors that have been preliminary identified as practical and workable indicators in Makerspaces • Parents and entire communities will be encouraged to be active in supporting youth • KMN model is holistic and integrates many approaches
10. A death by suicide occurs in a community	Confidence in Makerspaces may be damaged	<ul style="list-style-type: none"> • A death by suicide is devastating for an entire community and the country at large; some children experience extreme adversity earlier in their lives that Makerspaces cannot address. • Staff will be trained with ASIST and trauma-informed practice to provide guidance and first aid to a person at risk in ways that meet their individual safety and privacy needs. When appropriate, mental health experts will be asked to intervene. In no way will Makerspaces staff attempt to provide professional or clinical care. • Parents, teachers, KMN-L leaders, professionals and community members at large need to collaborate on holistic support for each youth – it takes a village • Counseling for parents and youth peers
Community Support		
11. Weak community support	Project stalls due to community misunderstanding or internal resistance	<ul style="list-style-type: none"> • Inevitable that some individuals may be off-side – important to identify change champions as essential part of change management strategy • Strong local communications and outreach strategies need to be in place to avoid information gaps

12. Engaged parents play a critical role	Parents may be too overstretched to play a strong role; home life may be a mitigating factor	<ul style="list-style-type: none"> • Parenting sessions and parenting tools will be offered to the community • Professionals can be alerted as necessary • Tools can be developed for parents • Someone on call 24/7 at KMN-L and/or other hotlines
13. Multitasking	Community members are often overstretched with numerous other community responsibilities	<ul style="list-style-type: none"> • Sufficient resources need to be available to the extent possible to hire staff • Premium to be placed on creating good, full-time jobs
14. Understanding terminology	Language barriers may pose a challenge, as well as a focus on new terminology	<ul style="list-style-type: none"> • Terminology used will need to be defined clearly in both English and Inuktitut

Chapter 4: Project Management

The purpose of this chapter on Project Management is to show how the initiative would be implemented and managed. It will be organized around several **work streams**, each of which will consist of activities arranged as **tasks** and **subtasks**.

The initiative will, in fact, go well beyond the resources of the Challenge Fund. However, the initiative is triggered by the Fund and thereby accountable to the Challenge Program funders. The Project Management would fulfill the mandate accorded to the Fund's recipient, and as enshrined in a **Project Charter** (or contribution agreement). This Charter would spell out the roles and responsibilities of each party, and the arrangements for releasing the funds according to a milestone schedule. As the instrument to implement the initiative, the Project Management system is situated within the governance framework. The Project Charter is the agreement between the Challenge Fund and the to be constituted Katinnganiq Makerspace Network (KMN). Please see Governance Chapter 2 for the details about the structure and authority of the proposed KMN non-profit organization.

As indicated in the Introduction, the ambition of the initiative is transformative – In that sense the initiative is all about “**change management**”. Thus, the Project Management functions are very much oriented toward learning, collaborating, and innovating. An important vehicle in this desire to improve the protective factors of Inuit youth is the utilization of **technology** – improving broadband and its applications and uses to the individual hamlet communities. Accordingly, the Project Management remit includes deploying communications and IT technology – as described later in the Technology Chapter. As a change management process, the Project Management approach must clearly include effective engagement practices to help bring along the targeted communities. This **engagement process** is described in more detail in the Engagement Chapter.

Part of the success of the project will be in the collection and handling of the socio-economic and project data, which is one work stream of Project Management. How the **data generated locally is managed** in terms of maintaining personal and community privacy is discussed in the Data and Privacy Chapter.

The Project Management is governed by the resources from the Challenge as well as other financial and in-kind services supplied elsewhere. The Financial Chapter outlines the **budget** for the initiative, at least for that part that is covered by the Challenge Fund.

This Chapter outlines the proposed project management system for the 5-year life of the initiative under the aegis of the KMN. This not-for-profit organization is to be set up as the proper authority to receive the Challenge grant and be responsible for the expenditure of the public money transferred to it - see the Governance Chapter. It will extend funds and services to locally organized **Makerspaces**, which are referred to as local KMNs, or KNM-Ls in the up to 25 Inuit communities that represent the potential beneficiaries of this project. As such, a central challenge for the project management's is to manage the process of creating the local Makerspaces in each of the hamlets in which there is a locally committed entity to work with the KMN.

The process of setting up and supporting these Makerspaces will include working with partners to establish free, public peering points (Internet Exchange Points) and **data centres** in communities with a Makerspace program. The project management team would be responsible for working with partner suppliers through agreements, contracts and training to help the communities install and maintain these data centres and Internet exchange points - see the Governance and Technology Chapters.

The project management system consists of a project management office (PMO) for receiving and allocating funds, operating an effective financial control system, milestone-based accountability, and the performance management system (see Performance Management Chapter) to evaluate project performance. Through funding it will receive for the Smart Cities the project management will hire, contract, and grant money for services rendered through standard contracting purposes.

Project Management Approach and Principles

The project management approach is designed to fit within the philosophy of all the institutional elements and values describing the Nunavut Territory and this initiative. It is one of collaboration, consensus building, and learning and sharing. It is also about capacity building. The project management approaches and principles that have been followed right from the start of the application process are the following:

Effective Partnerships and Relationships - A culture grounded in common values and principles is essential to project success. These values need to guide behaviour, support customization of local delivery, and enable empowered local sites, consistent with modern management approaches.

Sound Leadership - Dialogue, good communications, supporting a cooperative culture are all dependent on strong, credible leadership committed to a culture of excellence. Selection of the KMN board Chair, members, ED and securing the best talent locally are key ingredients.

Talent Development - The Nunavut Inuit talent pool is small and talented individuals are often multi-focused. Timely development of local leadership, especially youth, is a key dependency of this project. KMN will undertake talent identification jointly with communities and develop and launch practical training programs focused on essential project skills

acquisition. Some outside or non-Indigenous talent will be necessary in certain specialized professional areas.

Capacity Development - Shortage of organizational capacity at the local level for management of a makerspace: in this case, the KMN will leverage its resources and work closely with the specific hamlet to support and create capacity within the community. There is also a shortage of teachers/capacity for programs facilitators – which will need “train the trainer” approaches and capacity building programs in terms of curriculum delivery and administrative support.

Self-Sufficiency - While the Nunavut culture of self-sufficiency is strong, extra efforts by both the KMN and local hamlets are essential to securing the future of Makerspaces into the future. Discussions have already been held with supporting stakeholders, and proponents of Makerspaces are optimistic about future funding prospects.

Sustainability – From the beginning it is understood that a major challenge is to ensure the sustainability of the project beyond the lifecycle of the Challenge. This initiative seeks to work with each community to create capacities and implement a sustainable plan for the long-term maintenance of makerspaces, including beyond the life-cycle of this grant.

Transition from Smart Cities Challenge Application

For the past year in the application process, project management has been carried out as a joint venture among the 4 core organizations with the active participation of a range of other Nunavut stakeholders. We have operated under a governing MOU which sets out the authorities and decision-making responsibilities. Pinnguaq has acted as project manager since the shortlist award, while NAM has acted as the financial controller.

Upon notification as a recipient of one of the \$10M awards, a transition process will ensue to negotiate the Project Charter and to set up the KMN, as described in the Governance Chapter. The KMN will need at least three Board members (Chair, vice-chair and Treasurer) and one staff (Executive Director) for initial deployment, in order to launch the initiative. In recognizing that individuals wear many hats and the need to support emerging leaders, the collaboration between NAM, Pinnguaq, QHRC and Embrace Life Council will act as a transitional board with the workforce capacity to set up the process.

This initial board would elect a chairperson and the board would hire a start-up executive director. As explained in the Governance Chapter, the executive director could be contracted for an interim basis, preferably someone who has been fully involved with the initiative and who has project management skills and experience.

The KMN chair, board and ED will need to set the tone of the initiative at the outset. Makerspaces integrity and securing public trust will depend on sound guardianship of public funds. The Chair will establish a culture of accountability and code of ethics from the outset and ensure that the board has a full sense of the nature of public scrutiny to satisfy donors and board constituents (partners, stakeholders, volunteers).

The KMN board will need to accelerate development of governance tools which will both guide and direct key activities across Nunavut, including policies (on essential things like conflict of interest, privacy, accounting requirements, rules of conduct), by-laws, strategic planning requirements/goals with clear goals and milestones to guide the ED's business plan, clear

reporting structures, a funding strategy to secure Makerspaces long term future, a community consultation framework, a public communications strategy – among other start-up activities.

Project Management Staffing

Since the main purpose of the KMN is to implement the vision of the initiative, the Project Management team and the staffing of KMN are essentially one and the same. Apart from the executive director, the project management team would consist of the following positions – which could be filled through straight hires or contracts, for full or part time, and for short or long durations. Some individuals might be available for part time, or for a short time, and might be more suitable to start-up than managing the program geared to the creation of a network of effective Makerspaces in each hamlet in Nunavut. The likely early full or part-time hires would be the following:

- **Director of Finance & Development** to establish proper control systems and processes as well as manage the cash flow and accountability requirements for the award recipient, the KMN and to develop a fundraising plan;
- **Outreach and Engagement Coordinator** to work with the executive director to develop the relationships with hamlets that will encourage their starting up the Makerspaces in each community;
- **IT Manager** to work in parallel with the executive director and engagement relations director to oversee the deployment of computer and telecoms equipment and connectivity for the Makerspaces start-up and operations, along with training for staff;
- **Content and services development director** to build on the modules of t(e)ach and other curriculum (or extra-curricular) support material along with digital art and other content material to be distributed to Makerspaces;

Again, the above depiction of opening positions is pro forma only. Some responsibilities might be combined or separated; some positions might be filled by the same person; some may be assumed by a firm as opposed to an individual. The structure may change depending on priorities, and availability and skills of the individuals taking those positions. However, the functions that make up each of these positions are key to the success of Project Management.

Work streams and work breakdown structure

This Chapter translates the vision of this proposal into work streams (milestones) with multiple activities in each stream that are called tasks and sub-tasks (deliverables). The main work streams identified below place the work plan into manageable categories for performance measurement and implementation. The table below shows this work breakdown structure in brief, at the work stream and task level. This table is followed by a text that describes the tasks and subtasks in more detail.

Stream

Task

Stream 1 - KMN Start-up and Engagement

- Task 1.1 – Set up physical office
- Task 1.2 – Constitute KMN
- Task 1.3 – Negotiate Charter with Challenge Program
- Task 1.4 – Set up KMN operational systems
- Task 1.5 – Assess community readiness and select
- Task 1.6 – Create Makerspace roll-out plan
- Task 1.7 – Engage and obtain hamlet commitment

Stream 2 - KMN Content and Platform Development

- Task 2.1 - Establish initial programming and technical plans
- Task 2.2 – Leverage Te(a)ch Curriculum
- Task 2.3 – Develop Elder-Led Curriculum
- Task 2.4 – Develop Adult learning curriculum
- Task 2.5 – Develop Arctic Internet Exchange program
- Task 2.6 - Roll-out bandwidth and data centre program

Stream 3 - Deliver Youth Programs and Activities

- Task 3.1 Deploy programming and training to each participating hamlet
- Task 3.2 - Operate programs and activities
- Task 3.3 - Draft requirements for interconnected web-based platform
- Task 3.4 - Deploy technical facilities to each participating hamlet
- Task 3.5 - Train, recruit for follow-up years

Stream 4 - Manage the KMN-L start-ups

- Task 4.1 Support local KMN-L start-ups
- Task 4.2 – Build management & accountability structures
- Task 4.3 - Deliver training
- Task 4.4 – Support program delivery
Operationalize reporting and financial management systems
- Task 4.5 - Develop a Data Privacy System

Stream 5.0 – Performance Measurement, Reporting, and Sustainability

- Task 5.1 – Develop Performance Evaluation Framework
- Task 5.2 – Conduct annual performance evaluation

Task 5.3 – Report and conduct independent evaluation

Task 5.4 - Develop a plan for continued and multi-year fundraising

Task 5.5 – Raise new funds

Stream 1.0 – KMN Start-up

Task 1.1 – Set up Physical Office: Find office space for KMN or share space with the current pilot Makerspace location in Iqaluit.

- Negotiate lease, connectivity, services
- Deploy data center and IXP switches and routers at the QHRC office in Iqaluit
- Fit out (as necessary) and move in

Task 1.2 – Constitute KMN: The incorporation of the KMN and the recruitment of the board of directors and staff will take priority in the implementation sequence and will provide the platform for the implementation of the rest of the initiative.

- Incorporate KMN as a not-for-profit
- Establish Interim or first stage Board of Directors
- Set up sub-committees/create bylaws
- Set up Advisory Boards

Task 1.3 – Negotiate Charter with Challenge Program: such a document would in effect be the contract between the recipient of the award and the Challenge Program management.

- Establish negotiating roles and schedule for creating the Charter
- Develop key considerations/provisions of the Charter
- Determine constraints and flexibilities from the government side
- Develop milestones and payment schedules
- Gain board approval and sign

Task 1.4 – Set up KMN operational systems: Such policies as internal quality and financial controls will be put in place, e.g., board approval for expenditures over a certain amount; multiple financial sign-offs; purchasing processes and approvals and guardianship of physical assets; transparency through outside auditors; employee timesheets, etc.

- Develop statement of values and ethics and operating principles
- Develop financial controls and processes
- Create human resources policies, requirements, job descriptions and reporting relationships
- Create detailed budget or first quarter, and pro forma budget for first full year
- Establish organizational and decision-making structure

Task 1.5 – Assess Community Readiness and Select - Makerspaces will be deployed according to a readiness and community capacity assessment framework established by the KMN board.

- Assess community resources, availability of physical spaces, human resources and community social profiles
- Identify local delivery partner to take ownership of makerspace

- Secure agreement (in-principle) with hamlets to proceed with the investment in a Makerspace facility
- Identify communities that will launch Makerspaces in first year

Task 1.6 – Create Makerspace roll-out plan - Develop a detailed roadmap for the rollout of Makerspaces in each community, including steps for engaging communities and obtaining agreements.

- Define the requirements and identify best practices for dialoguing with the communities
- Develop a model agreement (“Project Charter”) plan and define KMN’s services and investment plan
- Test and modify in association with hamlet councils and other groups

Task 1.7 – Engage and obtain hamlet commitment - KMN will build on its contacts with the hamlets established over the life of this initiative and engage in further consultations. Critical to this engagement is to identify champions at the community level, as well as human resources with sufficient interest, expertise, and motivation to participate in the development and operation of a Makerspace in that community.

- Determine overall Makerspace resource requirements for years one-five and submit resource requirements and final program details to the funder, as required.
- Sign community “Project Charter” agreements staggered over 5 years. The Charter will focus on local ownership for managing delivery.

Stream 2.0 – KMN Content and Platform Development

The existing 75 modules of the te(a)ch k-12 curriculum constitute an important asset for makerspace programming that Pinnguaq Association, in collaboration with its partners, has been developing over the past year. It will become publicly available on March 5th, 2019. This program was supported by ISED’s CanCode granting program and will be expanded upon in the Technology Chapter.

Task 2.1 - Establish initial programming and technical plans

- Concurrent with the deployment of Makerspaces will be the development of community data centres running Internet Exchange Points, a neutral routing location where ISP’s, content and network services providers, educational and government networks meet (“peer”) to interconnect networks.

Task 2.2 – Leverage Te(a)ch Curriculum

- Expand te(a)ch curriculum
- Make expanded curriculum publicly available

Task 2.3 – Develop Elder-Led Curriculum

- Work with Elders to identify preferred knowledge and skills to be worked on
- Work collaboratively with Elders to follow and document processes and create a set of modules around the topic

Task 2.4 – Develop adult learning curriculum

- Create 40 pieces of adult learning lessons geared towards an introduction to fundamental digital literacy skills and networking

Task 2.5 – Develop Arctic Internet Exchange program

- Contract Nuvujaq, the project's telecoms services partner
- Work with Nuvujaq to leverage its staff and resources to deploy data centres in KMN-Ls as they sign up with KMN
- Work with community to onboard willing peers to the IXP
- Identify suitable location, collaborating with community makerspaces whenever possible
- Create agreement with data centre or land owner (Arctic IX)

Task 2.6 - Roll-out bandwidth and data centre program

- Ship and install data centre (if required)
- Install IXP equipment (1 switch and 2 route servers, pre-configured before shipping)
- Enable peering networks to connect fibre, wireless or satellite to building and/or setup servers and networking equipment within data center

Stream 3.0 – Deliver Youth Programs and Activities**Task 3.1- Deploy programming and training to each participating hamlet**

- Recruit/enroll target youth
- Document progress jointly with each youth

Task 3.2 - Operate programs and activities

- Te(a)ch extra-curricular learning, peer circles, elder mentoring and traditional language/culture revitalization programs and projects, recreation, creative arts, leadership training
- Administer pilot tests to new programs
- Deploy new programming and updates

Task 3.3 - Draft requirements for interconnected web-based platform

- Develop user forum
- Coordinate network storage strategy and group software bundles
- Develop local source control repository (i.e. Git)

Task 3.4 - Deploy technical facilities to each participating hamlet

- Install Internet Exchange
- Install, maintain broadband infrastructure

Task 3.5 - Train, recruit for follow-up years**Stream 4.0 - Manage the KMN-L start-ups**

This stream will be undertaken in adherence to values and principles of modern management - enabling, empowering service deliverers, a shift away from rules-based management. It is also necessary when working in different contexts/locations where a one size fits all rule may not be applicable and local solutions are encouraged.

Task 4.1 Support local KMN-L start-ups

- Recruit and onboard local executive director with appropriate training
- Procure physical space for the community Makerspaces
- Recruit and train (staff should be dedicated full-time and local to the extent possible); technical, managerial and facilitation training will be provided for staff
- Recruit and train local staff for operating the Makerspace, including broadband connectivity and links to the local data centres
- Build, retrofit, furnish, and connect the physical facilities

Task 4.2 – Build management & accountability structures

- Develop bookkeeping systems, uniform financial reporting, job descriptions, results measures, purchasing, codes of care in dealing with youth (police clearances, handling situations, etc.), technology use and training/certification requirements.
- Convert to the Manual which would include templates, processes, incorporation material (including registration and bylaws), leasing agreements (space and equipment) and pro forma budgets and for the local KMNs.

Task 4.3 - Deliver training

- Develop modules for the KMN-L staff and local board
- Administer technical, managerial and facilitation training (ongoing)

Task 4.4 – Support program delivery

- Deliver Laptops through the CFS program (where the Pinnguaq Association works to make computers available to any Nunavummiut or Nunavut based organizations that require them through the Computers for Success Nunavut Program, funded by Computers for Success Canada and ISED.)
- Support local delivery organization in managing the programming of its own space, with access to the te(a)ch curriculum through an e-learning content management system at first, and later integrated into the KMN Network.

Task 4.5 - Develop a Data Privacy System

- Consult with KMN-L and hamlet community
- Design and review with the Privacy Commissioner of Nunavut
- Implement in first year

Stream 5.0 - Performance Measurement, Reporting, and Sustainability

Performance measurement is also key to maintaining public trust. Outcomes measurement through meaningful data is essential to demonstrate that organizational mission and goals are being achieved. Metrics, both quantitative and qualitative, will be established for

each activity. Affordable financial systems that can deliver performance data for to guide the ED's business plan and outputs, as well as qualitative social indicators. Sustainability involves making the program attractive to an increasing number of stakeholders and obtaining sufficient revenue sources to sustain the program beyond the 5-year Challenge funding period.

Task 5.1 – Set Performance Evaluation Framework

- Modify identified metrics in collaboration with each community
- Develop evaluation materials

Task 5.2 – Undertake Annual Performance Evaluation

- Collect data for identified metrics
- Year 2 onwards, compare collected data with baseline data collected in previous years
- Incorporate feedback into service delivery and opportunities for course correction

Task 5.3 – Reporting and Independent Evaluation

- Annual public reporting is the tool for conveying this information to funders and constituents. Both written reports and community public meetings will provide the necessary transparency.
- Evaluation is a key aspect of demonstrating performance. Periodic independent evaluation will be undertaken in accordance with funder requirements.

Task 5.4 – Develop a plan for continued and multi-year fundraising

- Prepare different budget levels depending on the rate of roll-out to communities
- Assess impact of new funding sources on the realization of the plan
- Identify sources of funding for different aspects of local makerspaces

Task 5.5 – Raise new funds

- Identify new stakeholder targets for supporting the KMN infrastructure and programs
 - Develop campaigns for additional support
- Execute campaigns with supporting stakeholders – governments, private/public companies

Identifying and managing risks through risk mitigation strategies

Risk	Description	Mitigation Action
Project Management		
1. KMN and/or KMN-Ls fall behind schedule	Outcomes and funding milestones are not met	<ul style="list-style-type: none"> ● Early warning project mgt schedule already in place. ● Build flexibility into timeframes for unanticipated events. ● Early alerts to funders for possible schedule changes
2. KMN and/or KMN-Ls fall behind schedule	Outcomes and funding milestones are not met	<ul style="list-style-type: none"> ● Early warning project mgt schedule already in place. ● Build flexibility into timeframes for unanticipated events.

		<ul style="list-style-type: none"> • Early alerts to funders for possible schedule changes
3. Issues arise because of programming has critics, does not fit the community	Some communities may experience problems with the content of the curriculum or its delivery to youth, or cause concern in the community	<ul style="list-style-type: none"> • Early course material is tried and tested • Exec directors/instructors at KMN-Ls are well trained and encouraged to report issues for resolution • Good community rapport is super-emphasized in the project to avoid communications breakdowns • Courseware will be tested before going into full use • Board members with expertise in wellness services will ensure access to proper wellness guidance
4. Complementary funding falls short, or is late – or is misused	Besides the Challenge program funding, this initiative depends on a variety of other funding sources – and shortfalls could occur; Misuse is always possible at the KMN or KMN-L levels	<ul style="list-style-type: none"> • Invest in strong control and fundraising skills in key KMN staff, who will take prudent measures to ensure program stability. • Treat fund raising as a continuous activity from the launch of the project • Control function will establish procedures for monitoring, tracking transaction in real time, such as multiple sign-offs on checks, at least 2 level review of bank statements, external audit, etc.
5. Persistent breakdowns of the technical infrastructure	Location of Makerspace, equipment failure, inadequate maintenance, or other causes of interactivity breakdowns	<ul style="list-style-type: none"> • Work with tried and tested service operators • Train, train, and train the Makerspace team, rather than rely on one maintenance person in the community • Establish an online support service to help a community to troubleshoot.
6. Staff turnover disrupts operations at KMN or KMN-L	Retention in stressful occupations is doubly difficult in the North	<ul style="list-style-type: none"> • Build redundancy in the overall KMN community, and bring in trainees/interns as a natural outgrowth of a sought-after employment • Bring local communities into the KMN-L family to provide other reasons to stay, grow with Makerspace
7. Youth issues prove to be intractable in some communities, thus jeopardizing Makerspace program	Because there are many pressures on youth in Inuit communities, Makerspaces and its programming may not be able to cope	<ul style="list-style-type: none"> • KMN's emphasis on community involvement in Makerspaces should reduce exposure to this risk • KMN will have enlisted support from a variety of stakeholders, e.g. social and medical services, hamlet officials, and other service organizations – so

		wholistic approach should help mitigate risk
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Risk management requires advance preparations for unexpected events that are sure to arise. A two-part strategy will be utilized – prevention and mitigation. [Training and awareness are the best tools for prevention. And effective management practices that ward off any form of corruption, such as multiple sign-offs on checks, at least 2 level review of bank statements, external audit, etc.

Working with youth has unique security requirements as well as youth worker training to work with at-risk youth. Makerspace leaders will need to be knowledgeable of youth services available for referral in the community, including mental health, substance abuse, housing, vocational training, parenting requirements, etc.

Project schedule, deliverables and payment schedule

Because of the simultaneous, circular and collaborative character of this initiative, with several ongoing activities at any given time - we believe that an outcomes-based contribution payment schedule could be provided in four equal amounts, once per quarter, to account for the different ongoing (annual) outcomes, according to the budget submitted.

	Year 1	Year 2	Year 3	Year 4	Year 5
April		\$ 532,750.00	\$ 538,800.00	\$ 526,850.00	\$ 537,150.00
June	\$ 364,450.00				
August		\$ 532,750.00	\$ 538,800.00	\$ 526,850.00	\$ 537,150.00
September	\$ 364,450.00				
December	\$ 364,450.00	\$ 532,750.00	\$ 538,800.00	\$ 526,850.00	\$ 537,150.00
March	\$ 364,450.00	\$ 532,750.00	\$ 538,800.00	\$ 526,850.00	\$ 537,150.00
Sub -Total	\$ 1,457,800.00	\$ 2,131,000.00	\$ 2,155,200.00	\$ 2,107,400.00	\$ 2,148,600.00
Total	\$ 10,000,000.00				

Below is the Gantt Chart for the project tasks (milestones) according to a schedule for the next 5 years, with the first year being the most detailed one.

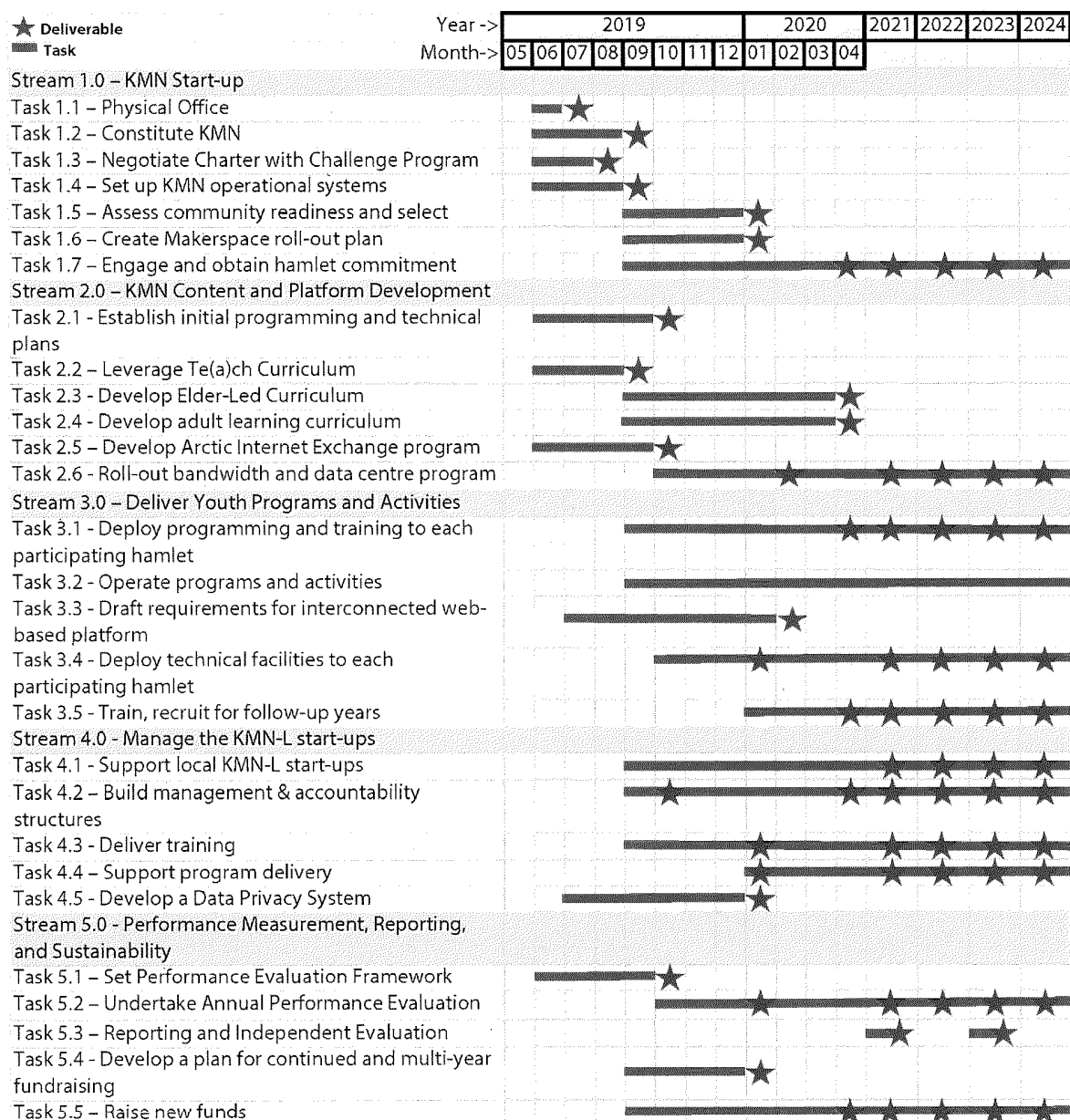


Figure 4: This figure is Gantt chart outlining the project schedule and deliverables

Chapter 5: Technologies

Currently, internet in Nunavut is connected by satellite, and internet connections are offered to all Nunavut communities by the internet service provider SSi Micro⁴⁹ - with connection speeds of 5Mbps delivered by Telesat's C-Band Satellite. However, the connectivity landscape is quickly changing. In July of 2018, Telesat launched Telstar 19 VANTAGE, a new generation Ka-band satellite that combines broad regional beams and powerful high throughput satellite (HTS) spot beams⁵⁰, which will service the North with connection speeds of 15Mbps. Northwestel has recently received \$49.9 Million in funding from the Canadian Government's Innovation, Sciences, and Economic Development (ISED) department to build 25 new satellite earth stations to deliver this 15Mbps high-speed broadband data to every single Nunavut community by the end of 2019⁵¹. At the same time, Telesat will deploy a constellation of low-earth-orbit (LEO) satellites (~1,000 km from earth; ~35 times closer than traditional satellites) that will be able to provide fiber-like quality throughput anywhere on earth by 2022⁵².

Amongst these rapid changes, The KMN will be a source of ongoing support to ensure that Inuit communities gain from these rapid technological advances, benefitting the future of Inuit youth. The technologies presented here will seek to open up local communication portals for both youth and communities to connect; build capacity in children, youth, and adults to gain technical and problem-solving skills; provide opportunities for individuals to gain access to local, relevant, and Inuit-specific content and educational materials, and to provide tools and devices to support the interests and strengths of individuals through central community hubs (makerspaces). The breakdown of activities include the deployment of internet exchange points, the creation of a digital Makerspace network platform, and the deployment and further development of learning and capacity building resources and tools.

The Arctic Internet Exchange

As mentioned, internet in Nunavut is connected by satellite through each network (Northwestel, GN, Qiniq, Ice Wireless, SSi Micro), but those networks do not interconnect, meaning that connecting to a site to and from different networks requires two satellite hops, making connections expensive and slow.

An Internet exchange is an organization responsible for running Internet Exchange Points (IXPs), a neutral routing location where ISPs, content and network service providers, educational and government networks meet ("peer") to interconnect networks. An IXP

⁴⁹ Other ISP's like Ice Wireless, Northwestel offer internet services only in select communities, but that will soon change.

⁵⁰ "Telstar 19 VANTAGE Successfully Launched by a SpaceX Falcon 9 rocket from Cape Canaveral on July 22, 2018." Telesat. N.p., n.d. Web. 26 Feb. 2019. <<https://www.telesat.com/our-fleet/Telstar-19-VANTAGE>>

⁵¹ Canadian Radio-television and Telecommunications (CRTC) targets for urban centres as well as in rural and remote areas of Canada is of 50 Mbps download and 10 mbps upload for broadband Internet access services on fixed and mobile wireless networks.

⁵² "Why LEO?" Telesat. N.p., n.d. Web. 26 Feb. 2019. <<https://www.telesat.com/services/leo/why-leo>>

establishes a trustworthy location for networks to meet. It keeps local Internet traffic from leaving the community, enables greater security and network services, and often lowers transit costs.

The technology is very simple, the Internet Exchange manages traffic exchanged at an IXP over a shared Layer 2 “switch” which networks connect to and communicate using the Border Gateway Protocol (BGP). Becoming a member of an IXP requires an Autonomous System Number and a network connection from a router to an IXP switchport.

By having networks peer at local IXPs, Internet traffic routes efficiently, avoiding unnecessary long trips. This is especially relevant in remote locations like Nunavut, where Internet is slow, more expensive and often suffers huge latency and congestion over satellite. If networks in Nunavut start interconnecting, a significant portion of traffic that otherwise would have travelled over satellite (and back again) will route directly from one local network to another through the IXP. This will lower the costs to ISPs by decreasing the required satellite traffic (the largest expense for providing service in Nunavut). Not only will local users on different networks have fast connectivity when communicating to each other, but it establishes a community wide platform for high bandwidth applications, content and network services (cloud computing, storage, etc).

Currently in Canada, IXP's exist in Calgary, Edmonton, Halifax, Manitoba, Moncton, Montreal, Ottawa-Gatineau, Saint John, Saskatoon, Saint John and Vancouver. The Arctic Internet Exchange (Arctic IX) has been formed by Nuvujaq Inc and Nunageek Solutions Inc, and is sponsored by the Canadian Internet Registration Authority (CIRA) and the Internet Society. Its intention is to bring Internet service providers, government and educational institutions in the North to connect directly to each other to avoid a waste of resources, while enabling a regional and territorial wide platform for high bandwidth, low latency websites and applications within communities.

The Arctic IX has supported the Katinnganiq Smart Cities Challenge proposal in a collaboration that will see an initial installation of internet exchange points in Nuvujaq's 2 data centres (or in space rented at existing Northwetel/SSI Micro data centres) in five community Makerspaces - thus providing a repository and access point for local content, serving as a learning tool for youth in each community, and improving broadband internet service. Further deployments will be explored and supported where possible, with a hopeful deployment of 25 IXPs' throughout Nunavut communities.

Risks

Understanding and operating an Internet Exchange Point is fairly straightforward, but highly technical. One of the biggest challenges in operating IXPs throughout Nunavut will be overcoming the lack of technical expertise in the community. In order to effectively operate exchanges throughout Nunavut, we will have to provide a tiered support system that includes extensive documentation, technical support and training. This will be addressed through the IXP Network (<http://ixp.network/>), which promotes research and education of Internet Exchanges and IXP's, and includes building a training and support network that plugs into experts in Iqaluit and the south. Along with Nuvujaq and Nunageek, volunteers from southern exchanges (Calgary, Saskatoon and Toronto) will provide high level technology support and training to local Makerspace staff that are operating a data centre/IXP.

At the same time one of the primary design goals of Nuvujaq data centres is operational simplicity, with the ultimate goal of functioning with no local technical expertise. We will use a capacity sharing model that relies on one KMN IT position to train makerspace staff to run and maintain the data centres (if applicable) and operate the IXP's.

It is important to note that until GN and Northwestel/Bell decide to peer, an IXP will have little impact, so the primary goal for Arctic IX and the KMN is to work collaboratively with internet service providers to peer locally.

The te(a)ch curriculum

As previously described, the te(a)ch curriculum is a free K-12 computer science program designed for Northern and Arctic communities in Canada with digital content and materials that are culturally responsive to Inuit, First Nation, and Métis ways of knowing. The te(a)ch curriculum meshes a core learning focus of computer science fundamentals with game design, animation, and physical activity grounded in cultural exploration. It is a program with benefits that extend well beyond simply teaching "how a computer thinks". The goal is to implement equitable practices in digital literacy initiatives and harness the strength of Indigenous knowledge and ways of being to build agency and ownership in the use of technology as a creative tool in informed, safe, and positive ways.

The te(a)ch curriculum developed so far comprises 75 lessons or modules designed to support both teachers and students. It has been, and continues to be delivered both through one-week workshops in communities throughout Nunavut and Mushkegowuk Aski, as well as through a custom-made e-learning content management system (CMS). Pinnguaq Association has been developing this curriculum over the past 16 months for the purposes of increasing digital literacy and computer programming skills in the North, with modules soon to be available both in Inuktitut and in English. The first 40 modules will be launched online by March 6th, 2019 at <https://pinnguaqlearning.space/>. The curriculum lends itself well to be scalable and transferable to other Indigenous, rural, and remote communities across the region, with current adaptations being developed with Curve Lake First Nation. The curriculum is built on the 'Train the Trainer' model, which enables participants to pass on the skills learned in the programs to other community members, and to be a significant resource for teacher training and professional development. The subjects it covers so far include game design, computer fundamentals, online safety, minecraft, art design, digital storytelling, sound design, app development, VR/AR. For a full list and outline of modules, please refer to **Appendix B**.

At the same time Pinnguaq is working to develop and feature intergenerational programming based on Elder-led curriculum geared toward youth that address specific cultural practices, for example, carving, storytelling, printmaking, sewing, and tool-making, to mention of a few - through both physical and digital mediums. The need for this curriculum was re-asserted at the Annual General meeting of the Nunavut Association of Municipalities, which included the mayors of each community in Nunavut. This curriculum will provide an opportunity for Youth and Elders to learn from each others' strengths, build connections and intergenerational support for learning, while expressing cultural identity, documenting traditional practices, and building technologies and resources that support a particular craft and skill. These workshops will introduce the use of new digital skills that preserve and animate

Inuit cultural heritage and create cultural continuity in a digital environment, while at the same time creating capacity for youth to gain a set of employable and transferable skills.

Additionally, the Pinnguaq Association will be working throughout the next year on adding 40 modules or lessons that will be developed under the principles of adult learning to support digital literacy for community members beyond the k-12 age range. These will address foundations of computing such as *The Absolute Basics*, *Introduction To Coding*, *The Efficient Workplace*, *Web Safety*, *Web Development*, *Online Banking* and *E-Commerce*, *Search Engines*, *Wikis and Research*, and *Social Media and VoIP Applications*, among others. We also anticipate that as Makerspaces gather momentum and take shape in Nunavut there will likely be a demand for specific learning resources and curriculum to be developed, such as computer networking with an emphasis on BGP/IXP and network maintenance for the KMN Digital Platform. The KMN will work with Pinnguaq Association, along with other partners like Nuvujaq, Nunageek (Arctic IX), and Canada Learning Code to create the appropriate resources and deliver training programs.

Digital tools

Each makerspace will be set up with the necessary tools and equipment to support the programming priorities defined by each community. This will likely include a mix of technologies, including a tiered system of computers (laptops, high end desktops, VR machines), printers, cutters, tablets, cameras, speakers and A/V equipment, robotics, sewing machines, art supplies, electronics, hand tools, carving tools, printing press, etc. While a standard will be developed to support the te(a)ch curriculum, each community will have the flexibility to decide what tools and equipment will be needed, and that is appropriate for their space.

The KMN Digital Platform

The Katinnganiq Makerspace Network (KMN) digital platform has as its purpose to support social connections and collaborations digitally - as well as to enable access to tools and resources for building local capacities among teachers, youth, adults in technical functions. In every makerspace that will feature a computer lab; a digital platform will be setup in conjunction with network architecture that will allow administrators the ability to create individual accounts through a network authentication protocol like [Kerberos](#). Through a Single-Sign-On authentication, community members may gain access to the network platform on any machine, featuring: 1) user forum, 2) network attached storage (NAS), 3) a local source control repository (i.e. Git), and 4) software tools and learning resources.

A user may request a network account by visiting a makerspace and completing a brief orientation. The orientation includes an explanation of the Online Code of Conduct (expanded on in the Data and Privacy chapter) to the user which they must agree to at that time, and an on-site tutorial on how to use the network safely and responsibly. User membership provides access to the resources on the network which are mirrored across all communities, and it also supplies users with storage where they can explore and manage their content. The KMN digital platform includes:

1. User Forum:

The user forum will enable Makerspace users in different communities to connect with each other to discuss ideas, works in progress, ask questions, propose answers, and learn from each other. The form will be a custom solution based on a tailored LAMP stack application. The site will leverage caching and local storage to accommodate in areas where connectivity can be sporadic. In addition we will be tying users to their unique makerspace account ids to allow for seamless authentication to the forum.

2. Local Lab NAS (Network Attached Storage):

Each space will have a NAS (Network Attached Storage) solution. A NAS system is a storage device connected to a network that allows storage retrieval of data from a centralized location for authorized network users. NAS solutions are low-cost, scalable, and flexible. This hardware will maintain a RAID⁵³ type configuration such as Synology Hybrid Raid (SHR) which will maintain data integrity for the local lab and also be responsible for synchronizing individual user data on individual machines with the master copy in the lab - as well as containing the latest version of a software bundle. If the internet connection is down, user data will still exist in a central location (not on an individual machine) and the NAS will later be able to synchronize data updates with a cloud solution such as google drive when the internet becomes available. This will ensure that it will be feasible to store all user related data in a way where it can synchronize with the NAS and users are free to use any machine and still maintain access to their data.

3. A Local Source Control Repository:

The digital platform will host a Git server, which could host multiple repositories for the projects of the program as a whole; providing more reliable, local git access for advanced coders who take advantage of the Makerspace and encouraging collaboration between users. A source control like Git is a fundamental coding skill which is important to teach early to enable students to collaborate on projects, and work on the same code. Some of the options we have been considering are Gogs (100% open source and free of charge; all source code is available under the MIT license on GitHub), and GitLab Community Edition (an open source end-to-end software development platform with built-in version control, issue tracking, code review, CI/CD, and more).

The decentralized nature of Git will facilitate collaboration between Indigenous coders and developers across Makerspace sites, eliminating the requirement of a centralized server and adapting to the uniqueness of rural and remote regions where constant internet access is not always guaranteed. With Git, there is no single point of failure; Data redundancy is intrinsic to the Git decentralized model.

4. Software Bundles and Learning Resources:

⁵³ RAID (Redundant Array of Independent Disks) is a storage technology that combines multiple disk drive components into a logical unit.

The network will host quick and easy download bundles for all relevant open source software used in the te(a)ch curriculum (the lessons themselves are built entirely around open source solutions). A master bundle containing all the software to be deployed on each machine will be updated and maintained on a regular basis by the IT Manager of the Katinnganiq Makerspace Network. The software bundle will be intelligent enough to do simple version checks and only update software as necessary when a new version is required, or install new software as it gets added.

Deployment to Master from Cloud: This bundle will live on the cloud. Each space will have one "Master" machine which will be responsible for being in sync with the latest version of the software bundle. We will use a "Team" cloud drive which can be mapped and synchronized with the master lab computer in each space. This would normally be done via an internet connection, however it will also be possible to connect an external harddrive to a NAS (Network Attached Storage) to perform a manual update when necessary.

Deployment to Lab machines from Master: The Master computer in each space will be responsible for deploying the updated bundle to each clone machine. Each machine will essentially be a mirror of the software that lives on the master computer. Whenever there is corruption, an administrator simply needs to re-clone the master machine software onto a new harddrive to install on one of the clone machines.

We can also leverage google drive or similar cloud solutions to synchronize individual user data. Every user will have an account which is connected to cloud storage, and therefore any individuals work, code, saved application settings and customizations will be stored in the cloud and portable to any machine in the lab or at any other space.

For example, open source software available on the network to complement educational resources will include but not be limited to:

- Scratch 3: The latest in the world's most popular 'introduction to programming' software.
- Python: Advance programming for users ready to move beyond Scratch.
- TWINE: Open Source narrative storytelling engine.
- Lua/Love: More advanced but accessible programming engine for advanced programming.
- GraphicsGale: An open source pixel art program that is the subject of at least 5+ te(a)ch lessons
- GIMP: An open source competitor to the Photoshop series.
- Voxel Busters: An open source voxel art program for the creation of voxel based 3D models.
- Blender: An open source 3D modeling program used throughout the te(a)ch curriculum.
- LibreOffice: The latest version of the open source project to compete with the Microsoft Office Suite
- Inkscape 0.92.4: An open source professional vector graphics editor for Windows, Mac OS X and Linux.

Additionally, we will approach existing major companies to provide educational and/or offline versions of their software to the KMN digital platform, which will be complement with curriculum and workshops. These include **Google Suites, Unity, Unreal Engine, Gamemaker**, and others. The KMN digital platform will be built on a number of core principles:

- **Replicability:** The open source code for this network will be transferable to any new or existing community makerspace that wants to connect (depending on connectivity at each site, this can be done online or through the physical transport of content via airmail on a USB stick), at the same time that it can be used by other rural communities in Canada to create their own network
- **Sustainability:** With the development of curriculum on networking and network maintenance, alongside the te(a)ch curriculum – local capacities and transitioning plans will be built to monitor and maintain the network
- **Offline Accessibility:** Given the challenges of regular and consistent Nunavut connectivity, the network will be built to function both online and offline - with updates scheduled when internet is available.

Risks

The biggest risk to these projects are: the availability of internet access at a given time, human capacity to maintain and run these networks, and privacy issues as it relates to open source and connected community networks.

Limited internet access for users: We are addressing this mainly by making the makerspaces public places where technology tools, software, and internet connectivity can be accessed for free – with the support to learn how to use them in creative ways.

Unreliable networks: Connectivity in the Nunavut is unreliable at the best of times. As such, we are building tools that that work as well offline as they do online and that can connect and exchange information at times that don't tax the network. At the same time, we will contribute to improving broadband connectivity by working with the Internet IX to install local data centre and IXP's to improve latency and local traffic

Sustainability and Human Capacity: As addressed throughout the proposal, our focus will be on building technology/infrastructure not just as as end products but as constant learning tools.

Privacy Issues: This initiative will be develop the parameters of data sovereignty within an open source context by developing a strong privacy and data management plan.

Partnerships

The core technology partners in the development and maintenance of the Katinnganiq proposal will build the Katinnganiq Network, networking curriculum, as well set up the Internet Exchange Points and the Nunavut Research Network (with the support of Nunavut Arctic College as a requirement). The core team technology partners include partnerships with both the private and public sector to support the projects as a whole. These are:

- **The Pinnguaq Association:** As a not for profit technology startup and the lead developers of the te(a)ch curriculum,, Pinnguaq will bring its six years of experience delivering technology education in Nunavut to bear in this project.
- **Nuvujaq** is a Nunavut based not-for-profit society incorporated to advocate for improved connectivity in Indigenous, Northern, rural and remote regions and communities.

Chapter 6: Data and Privacy

This chapter addresses the need to develop processes, protocols, standards and agreements that prioritize privacy, safety, sovereignty and Inuit knowledge in data management and sharing design.

While our proposal embraces knowledge sharing, collaboration and open source technologies as processes grounded in Inuit values, our approach to data and privacy also acknowledges the detrimental impact that the prevalence of a colonial approach to research has had on Inuit, “as the most studied Indigenous peoples on earth [...] subjected to egregious abuses by researchers”⁵⁴. This approach has placed Inuit’s own role in research as marginal, while the beneficiaries of the research in terms of access to funding, data, research outcomes and career advancement lay with the researchers themselves. As a result, the notion of “open data in the context of indigenous peoples is a double-edged sword. On the one hand, open data could be used to inform development, allocate resources and set a future vision—and to influence wider public opinion and debates. On the other hand, opening up data may be accompanied by concern about protecting indigenous cultural information, rights and intellectual property”⁵⁵.

This proposal’s approach to research, data and privacy embraces the notion of Inuit data sovereignty, which aims to situate Inuit self-determination at its core by focusing on priorities that are established by, and serve the needs of Inuit in terms of the governance and management of data (including intellectual property) as well as the use of data to support governance and informed decision-making. This proposal, and this chapter focuses on developing data sovereignty networks and parameters to ensure that the creation, collection, analysis and ownership of data is led and owned by the communities themselves.

As it concerns the interrelationships between technology and capacity building - our proposal recognizes that the ability to develop technology and innovation research that reflect Inuit self-determination and data sovereignty is largely contingent on the access of Inuit to digital literacy and capacity building, tools, educational resources and peer and research networks, as well as funding. With a focus on training, capacity-building and ongoing support for both Makerspace staff and users, the KMN will play a pivotal role in supporting individuals in data collection, use and analysis, as well as community ownership, control, access, of the data generated through the different stages of this initiative.

The existing laws governing privacy or personal information and data that are to be considered in this scenario are the Personal Information Protection and Electronic Documents

⁵⁴ *National Inuit Strategy on Research*. Inuit Taipiriit Kanatami: 2018. Page 5 and 23. Web. 25 Jan. 2019.
<<https://www.itk.ca/national-strategy-on-research/>>

⁵⁵ Smith, Diane E. *Governing Data and Data for Governance: The Everyday Practice of Indigenous Sovereignty*. Australia: ANU Press, The Australian National University, 2016. Page 132. Web. 10 Dec. 2018.

Act (PIPEDA), and the *Access to Information and Protection of Privacy* (ATIPP) act. PIPEDA is the federal privacy law for private-sector organizations. Though the KMN will be incorporated as a not-for-profit, we will adhere to its principles. On the other hand, the Nunavut ATIPP governs public and governmental bodies and provides the framework for the right to access public records, as well as to protect the privacy of individuals whose personal information is collected, used and disclosed by public bodies. The KMN and its relationship with municipalities and hamlets, along with funding from public bodies provides sufficient context for regulation under ATIPP.

Our data management plan outlined below is aligned with the ten principles outlined by PIPEDA for the protection of personal information by adhering to and promoting the following principles: 1) Accountability, 2) Identifying purposes, 3) Consent, 4) Limiting collection, 5) Limiting use, disclosure, and retention, 6) Accuracy, 7) Safeguards, 8) Openness, 9) Individual access, and 10) Challenging compliance⁵⁶. Our data management plan outlined below is also aligned with Nunavut's Access to Information and Protection of Privacy Act's (ATIPP), as outlined in the chart below.

Data Ecosystem

The KMN staff and board will provide the governance structure and capacity to work with each hamlet/municipality on collecting and analyzing the data and KPI's necessary to effectively manage the design, development, implementation, maintenance, improvement, and evaluation of this initiative.

In terms of the data life cycle, we will comply both with PIPEDA and ATIPP as described in the following outline. At the same time, we acknowledge that some aspects of this outline will require more detailed solutions as community-led projects are developed - and we look forward to working with the Privacy Commissioner of Nunavut to flesh them out as we move forward.

The data ecosystem in this proposal is broad, and is organized below to provide more clarity on what data elements will be collected.

Data Life Cycle	Makerspace Data (registration and attendance)	Digital Platform Data (User forum, Local storage NAS, Git, e-learning resources and participants work)	Consultation & Evaluation Data (KPI's)	Authority
Elements	Name, contact information (or that of parent/guardian), age, community/location, sex, ethnicity, food allergy information	E-mail address, username, user-generated data (messages, photos, code, art projects)	Quantitative and qualitative (opinions + thoughts) data relating to KPI's as outlined in Chapter 3: Performance Measurement. Data will	

⁵⁶ *Privacy Toolkit for Businesses*. Office of the Privacy Commissioner of Canada. Web. 8 Feb. 2019.
<https://www.priv.gc.ca/media/2038/guide_org_e.pdf>

			be collected anonymously through simple and easy to read and manage tools (accounting for varying literacy levels and staff capacity)	
Collection	Seek <u>written, valid, and informed consent</u> from each individual for the collection of personal information and data. Outline who is collecting the data and for what purpose. At any point in time, an individual has the right to revoke their consent for the use of their personal information, along with the right to correction.			ATIPP - Part 2, Articles 40 and 41. ATIPP - Part 2: Articles 45
Use and Analysis	Data will be used to design programs catered to age group of attendees, as well as to protect individuals from possible contamination and risk to known allergens at each local makerspace.	Data will be used locally at Makerspace, according to individual desires (such as for feedback, collaborations or problem-solving) and sharing preferences. Interface design will enable users to delete their own content.	Evaluation data will be used and analyzed locally by staff working closely with central KMN partner for performance measurement. The data will be used to inform decision-making and improve programs.	ATIPP - Part 2, Article 43, 44
Storage	Physical (forms) and digital (spreadsheets) files stored at each Makerspace. File formats will conform to open standards and software whenever possible	Individual user data will be synchronized and stored both locally on an encrypted Network Attached storage device and on the cloud using a service such as Google Drive with data encryption.	Data will be stored and centralized within a central electronic database particular software (for example Efforts to Outcomes)	ATIPP - Part 2, Article 44
Trans- mission	Data will only be accessed by authorized staff at the Makerspace.	All data transfers will feature end-to-end encryption using software such as <u>Synology Cloud Sync</u>	Data will only be accessed by authorized staff, in password protected computers. Data will be encrypted in software like..	ATIPP - Part 2, Article 42

Sharing (disclosure) & distribution	Makerspace registration data will not be shared with any third-parties, and remain for the sole use of Makerspace staff to deliver programs.	Each individual will own their own data in the Network and share with others at will.	Data will be shared privately through accountability reports to funders, as well as internally with the KMN board and each Hamlet council. It will also be publically through published reports.	ATIPP - Part 2, Article 47, 48, 49
Re-Use and derivative production	Derivative production will be determined by individual users or communities as the owners of their own data. If the KMN will take on any derivative production or re-use of data (for example to improve services and performance with the creation of new tools, services, or products), it will do so with valid and informed consent, and through the principles of consensus with affected communities.			ATIPP - Part 2, Article 43, 44, 47, 48, 49
Archiving and Preservation	The data and personal informational elements will be kept on file for at least 12 months, and will adhere to the right to be forgotten.	The long term archiving and preservation of data utilized throughout this project will be collected in digital and physical exhibitions, integrated into curriculum, form part of working projects and used in evaluation and published (and/or peer-reviewed) papers or reports. Data will be archived in the user forum under each person's account indefinitely or until the user deletes it or requests it to be deleted.		ATIPP - Part 2, Article 44
Disposal	We will adhere to the <u>right to be forgotten</u> by erasing personal data and information on file as requested by individuals.			Right to be forgotten
Security	Files kept secure in administrative files on secure computer. Makerspaces will be locked after-hours and equipped with alarm where possible.	Single-Sign-on authentication (Kerberos) and NAS synchronization with encrypted software (Synology)		ATIPP - Part 2, Article 42
Access	Each individual and community will maintain their right to access a copy of the data to see how it is being used, and as preliminary step to the exercise of further rights like rectification and erasure.			Right to Access

A big part of this project and of defining the parameters for Inuit data sovereignty will include the development of a more detailed framework that outlines clear protocols with respect to indigenous intellectual property rights, which identify the consents required to access and use high-value cultural information⁵⁷. At minimum each community will have control and oversight of how the data collected is used, and will be supported by the KMN IT Manager through hands-on training, along with reference materials like the KMN Operating Manual.

⁵⁷ Smith, Diane E. *Governing Data and Data for Governance: The Everyday Practice of Indigenous Sovereignty*. Australia: ANU Press, The Australian National University, 2016. Page 131. Web. 10 Dec. 2018.

The KMN will provide direction on how to collect, analyze and use the data to inform-decision making, improve program delivery, reporting, and evaluation that ties back to specific agreements between the KMN and local makerspaces regarding performance measurement, with a priority on supporting community-owned data. At this stage, data may be aggregated and de-identified so that anonymity is guaranteed, thus protecting release of data from a specific community

We recognize the importance of user safety on a community network. To keep both physical and digital spaces safe, the KMN will develop a code of conduct as part of the operations manual as a resource for every makerspace to modify and implement. The user forum's content will also need to be centrally moderated periodically by the KMN IT Manager to make sure it is free of aggression or harassment, and are users abiding by the code of conduct.

Risks

Breach of security by staff or through insecure and vulnerable devices: We will prioritize staff training on privacy issues, set up confidentiality clauses as part of employment contracts and provide training for troubleshooting procedures to increase privacy settings of computers and devices. The technicalities in data collection need to be addressed through simplicity and training in the face of limited human capacity.

Users breach others users privacy: to mitigate this risk we will also provide training on how to use the network responsibly, as well as how to use adequate safeguards and practices. Additionally we will strictly require that everyone adheres to the privacy and code of conduct for both physical and digital spaces, highlighting and enforcing an environment of respect.

Cyberbullying: to mitigate the risks of cyberbullying we again, highlight an environment of respect and enforce our code of conduct, while at the same time integrating forum moderation into a staff position, most likely the IT Manager position at KMN. The moderator would be able to flag and take-down content that is deemed to be inappropriate, offensive or trigger-sensitive. At the same time, the te(a)ch curriculum contains a few modules on online and media safety that could be delivered by staff.

Chapter 7: Engagement

Inuit Cultural practice and the principals of Inuit Qaujimajatuqangit (the Inuit way of knowing) guide the Katinnganiq project in every step of its implementation plan and governance framework. These principles serve as guidance for our engagement philosophy, providing a check for our team who are both non-Inuit and Inuit, to ensure we are wrapping ourselves in a methodology that reflects the way Inuit have shaped the direction of their own success. These principals, when embraced as a core engagement philosophy ensure a process that will be collaborative and responsive to the needs of Nunavummiut. Specifically we root our engagement in the following principles:

Inuuqatigiitsiarniq (Respecting others, relationships and caring for people): At the core of any project centered around health, wellness and suicide prevention is a need to ensure that

respect and care for the people we're working with is centered at our engagement process. This means engaging in a care based model of listening, and challenging one's own assumptions of what is a 'best' or necessary approach.

Aajiiqatigiinniq (Decision making through discussion and consensus): From the beginning we have practiced acceptance in that we don't know the answers that will work for every community. The proposal that you are reading today was arrived at through lengthy discussions and involved collaborations between the four organizing partners, taking into account community feedback. Moving forward, the implementation and success of this initiative will require that discussion and consensus be placed at the heart of the decision-making process and govern the relationships between the KMN and each community. When engaging with partners and individual residents, our reliance on the principal of *Aajiiqatigiinniq* will mean we are first and foremost listening and adjusting our outcomes for each unique community and the vision they identify.

Piliriqatigiinniq/Ikajuqatigiinniq (Working together for a common cause); The challenge statement identified in this initiative is one that resonates throughout the Territory with all Nunavummiut. Throughout our engagements past and future, our focus will remain on working together for this common cause, understanding that a unified, collective and holistic approach will have the most impact.

Moving forward, the KMN will work specifically with each community through conversations with Mayors, Senior Administrative Officers and Hamlet Councils, as well as with Recreation coordinators and community residents of all ages to identify their strengths and desires. It will conduct consultations and environmental assessments with each community to develop an implementation plan that responds to their vision, resources, capacity and readiness. The success of local makerspaces and of this initiative as a whole will be built on meaningful dialogues and engagements that enable a community-led approach to systems change through Makerspace deployment.

The proposal that is presented in this document was shaped in significant ways not by one or two pivotal moments but through a series of meetings, phone calls and conversations between the four collaborating organizations that brought forth for discussion their particular mandates and areas of expertise. These discussions were informed at different points by feedback gathered from our outreach efforts. During the preliminary proposal stage, every community provided a support letter for the initiative, but one of the most important opportunities we had this year was the chance to present, in person, the vision of the Katinnganiq proposal to the Mayor's at the Nunavut Association of Municipalities Annual General Meeting in Cambridge Bay (which also coincided with Infrastructure Canada's site visit). After our presentation we heard feedback from Mayors that included the following:

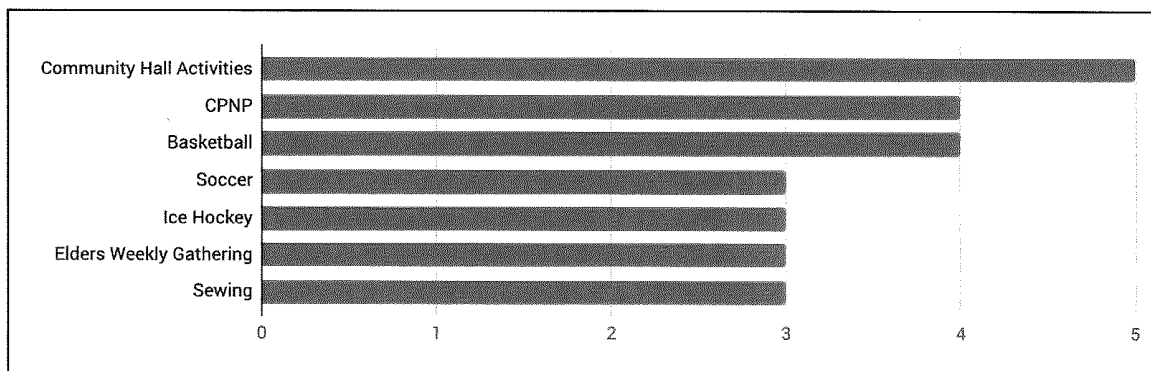
- A re-assertion of the need for space for youth and youth services in their community, since in most communities the majority of people are young
- A desire to see these spaces engage Elders as well as Youth - and facilitate teachings between them; A need for physical space where Elders and Youth to come together, learn Inuit traditions and work together to help each other go forward.

- A need for this initiative to reach the most vulnerable youth in every community - in terms of both space and curriculum - to give them a space to be and to learn. This is especially important for the pilot Makerspace in Iqaluit and the need to diversify inclusion approaches
- Curriculum must engage Elders and allow for Elder-led learning, on topics of their choice.
- Spaces need to address tool making between Elders and Youth, especially for hunting, and assist Elders in delivering those skills
- There is a need to teach Youth how to survive on the land, so there is a need to leverage technology for use on the land
- The proposal needs to expand definition of technology to include Inuit tools and skills
- That there is need to work together between communities - and that this project can be an avenue for working together
- That technology, curriculum, tools and learning environment needs to support language revitalization, to maintain the use of one's own dialect and support traditional knowledge

This feedback at the NAM AGM resonated with the internal conversations we were having, and became a framework for which to ground the proposal in. Throughout the following months, we've attempted to articulate the above and integrate this feedback into the vision of what a 'smart city' looks like in Nunavut.

Throughout the finalist phase we communicated by phone and by email with each municipality to share more information on the proposal, to request their input through a community survey, and to ask for a letter of support for the finalist phase. One of the other important opportunities for face to face consultation was when in January 2019, two members of our team travelled to Pond Inlet, Pangnirtung, and Qikiqtarjuaq to conduct consultation sessions with community members as well as with Senior Administrative Officials and Hamlet employees. In this trip, our team led a community session in Pond Inlet, but the rest of the trip was marked by adverse weather and travel conditions which delayed and cancelled flights, forcing them to reschedule travel plans. At the community consultation in Pond Inlet, 31 community members attended and provided answers to a set of four questions, which have been compiled below:

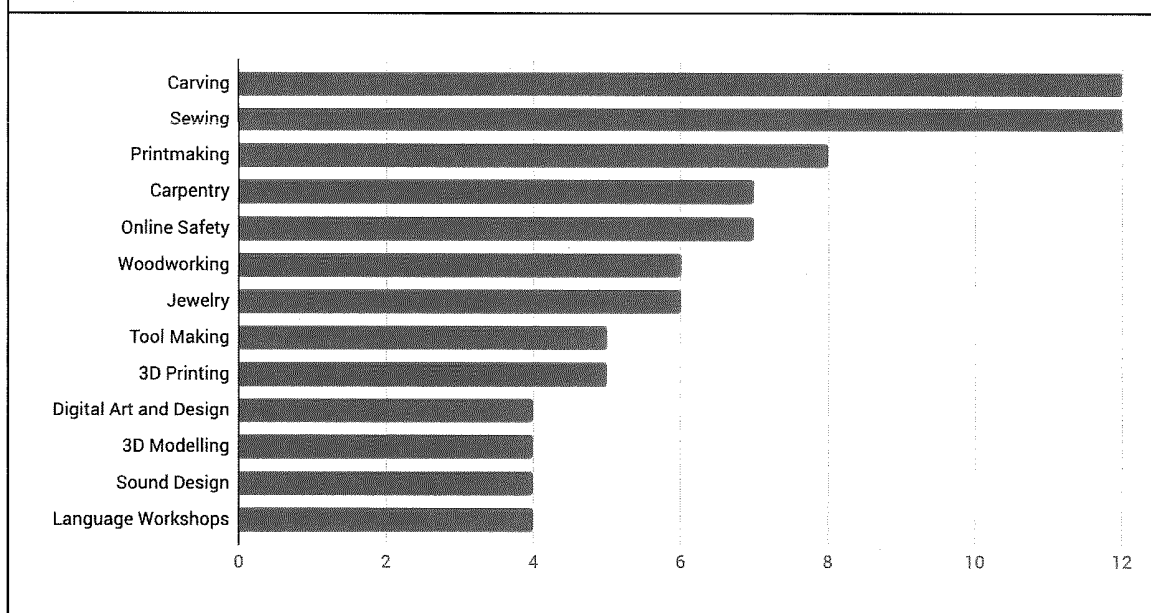
<p>1. <i>What general activities or wellness activities does your community already have?</i></p>
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Additional Answers

Volleyball (2) • Kids hockey (2) • Floor hockey (2) • Badminton (2) • Public arena (2) • Men's group (2) • AA meeting (2) • Indoor sports (2) • Pre-school (2) • Holiday square dancing (2) • Playing games (2) • Outdoor games • Game competitions • Tea party • Annual meetings for games • Prenatal • Art • Community wellness centre • School • Dances • After-school programs • Hunting and learning survival skills • All season hunting • Family grieving, healing • Fishing competitions • Science camp (summer) • Need more showing art and making Amauti

2. What are activities for wellness that you want to be doing?



Game Design (3) • Digital storytelling (3) • Computer Fundamentals (3) • Games (2) • App Development (2) • AR/VR (2) • Art (2) • Design • Beading • Crocheting • Knitting • Making Amauti • Leather making • Photography • Tools, stones and a proper facility for safe and proper learning skills in livelihood and economic benefits • Drop-in centre for children and youth • Teach young children about the dangers of drugs • Out on the land, hunting • Anything that includes training • Fishing • More activities for kids (6-10 year olds) • Homemade clothing to sell or something useful • Small engine repair training • Youth engagement with the land and parks • Language training for both Inuit and non-Inuit • Supper-making for children and youth (bringing home ingredients and left-overs)

3. What would you like to see be part of a makerspace in your community?

Theater (2) • Swimming (2) • Youth centre (2) • More public space to gather • Coffee • Office administration skills • Life skills • Cooking • Need house or workshop to do most of the above • Blacksmiths • More general activities for the youth • Marketing skills • More funding that suits local needs for betterment of the beneficiaries • Sewing • Printing art • Traditional Inuit stories made into cartoons • Getting ready for jobs for youth (how to make resumes, how to be prepared for a new career) • Making traditional clothing with youth • Youth involved with adults who are willing, and learn from them and the skills they have • Teach teenagers how to make homemade stuff • Carving • All ages learning something together • Storytelling • Courses on heritage and history • Making resumes • A shack and more staff • More public space for children and youth • Young people telling stories in their community

4. Do you have a skill that you would like to teach, support and mentor youth with?

Sewing (4) • Out on the land programs (2) • Yes, to tell and to show • Photography • Arts • Carving skills for over 18 years • Marketing art • Quarrying stones • Safety skills • Making Amauti and Parkas • Exploring patterns of clothing • How to work with leather (but no tools, etc) • Hunting, Fishing • Baking • Different kinds of design for hats, parkas, mittens and kamiks • Skinning seal and polar bear skin • Counseling and Healing • Talking with youth • I would like to learn too • We need to learn more

This information is part of the community level consultation that will be continued throughout the implementation of the initiative and inform each community's vision for their makerspace.

Another engagement opportunity we had was regarding Elder-led curriculum development. In Nunavut, Elders have said that strong relationships are the most important factors in child development. The *Inuit Qaujimajatuqangit (IQ Principles)* identify a set of values and beliefs which they feel are critical to positive personal development, as well as essential guiding principles essential for all Inuit. Over the course of one week, our curriculum development team from Pinnguaq Association and QHRC travelled to Arviat, NU to meet with the Aqqiumavvik Society to discuss the process of developing Inuit-specific culturally-based curriculum based on the principles of *Inuit Qaujimajatuqangit*.

Over the course of of this week our curriculum development team met with Shirley Tagalik, Joe Karetak and Elder Louis Angalik to learn about Inuit Qaujimajatuqangit Education Framework, and did a land trip with the Arviat Young Hunters Association and the Smart Ice Programme⁵⁸. They also met with local business owners to learn how they are using technology. This included Eskimo Point Lumber Supply (a local hardware and construction and maintenance business), the Arctic Co-operatives Limited, Hunters and Trappers Organization, Kiluk Ltd. (a local business focused on the production of fur and leather clothing), and the Hamlet of Arviat.

Lessons learned include the re-assertion that every community has their own unique needs and approaches to education and that curriculum development must be Nunavut-Inuit focused, and implementation must be responsive to the differing needs of each community. It not only helps preserve important knowledge and tradition, but also provides an Inuit

⁵⁸ SmartIce is an award-winning technological innovation for the North, it's the world's first climate change adaptation tool to integrate cultural knowledge of sea ice with advanced data acquisition and remote monitoring technology to study climate change. This was a great example of an organization that works with local experts.

perspective on personal growth and development, and how we relate to each other, to other living beings, and to the environment.

In the past few months we have also onboarded an Advisory Committee to provide feedback on the proposal as it was being developed. There were 7 members of the Advisory Committee included: Kathleen Gomes (First Nations Bank), Alisa Praamsma (Mental Health Commission of Canada, Lynn Stevenson (Canadian Foundation for Healthcare Improvement, Mara Grunau (Centre for Suicide Prevention), Charlotte Borg (Board of the Nunavut Kamatsiaqtut Helpline), Jesse Mike (Nunavut Literacy Council), and Joshua Nash (Canadian Federation of Medical Students). The Advisory Committee met twice through teleconference. The first meeting was on November 19th, 2018 which presented the revised vision of the proposal. The second meeting took place on January 22nd, 2019 which presented progress done to date. In both cases the Advisory Committee was able to provide feedback and resources for continued development of the proposal.

In general, our project engagement focused on three major strategies, all three of which will continue as the project moves forward.

- Territorial Gatherings

Getting together representatives of all 25 communities in Nunavut is an expensive and rare thing, but a few key events throughout the year allow the Katinniganiq team to share and request feedback on the project. The major gathering for consultation at the municipal level was the NAM AGM. With the participation of NAM on the board of the KMN, this will continue to be an important meeting moving forward to be able to report, request feedback, and have face-to-face conversations with Mayors and Senior Administrative Officials to address any collective action to be taken. Additionally, the KMN will seek to be present at other gatherings such as the Nunavut Economic Developers Association annual meeting to engage face to face whenever possible.

- Community Engagement

In the development of this proposal, engaging with community members at large in community visits were an excellent method to talk to individuals and learn about what they would like to see as part of this initiative. These opinions will shape the vision for their local makerspace as it is being developed. At the same time, one-on-one meetings with Hamlets were productive in understanding the intricacies of each one's unique situation, and will be necessary for the planning and implementation of this initiative into the future. With a governance framework that includes the broad representation of municipalities, Inuit organizations and leaders in both the public/private sectors of each community we will continue to build on consultations and engagement as a necessary and essential part of what this project hopes to achieve.

- Technology as a Connector

Already Nunavummiut are utilizing technology to share and expand their cultural practices, and the Katinniganiq project will leverage those existing uses for engagement in the

project. Facebook is a good example, with high usage in the North. Our engagement strategy includes a heavy use of Facebook and social media, along with our website as important information and outreach tools.

Though our experiences have been positive so far, consultation does not come without criticism. It is important to note that the constructive feedback we received, along with lessons learned through our team's experience, be processed and utilized to better improve our efforts. For example, though the spaces proposed in this initiative are intended to be led by and serve Inuit communities, it has been vocalized by leaders that these spaces need to include the most vulnerable sectors of each community, including individuals from low-income households, those who are un or underemployed, individuals who have not graduated from high-school and individuals who are differently abled. To address this, it should be important to make sure that outreach and access is continuously part of the administrative process, and that accessibility and inclusivity be integrated by design into both the physical spaces and the technologies utilized so that inequalities are not exacerbated or maintained.

With regard to accessibility, and underscoring that a part of this initiative concerns language revitalization, it is important to acknowledge the role of language and unilingual speakers. Throughout the engagement processes of this initiative, we have developed outreach materials in both Inuktitut and in English, as well as relied on live interpretation when needed.

Another important point that has been made is the need to support economic development and career opportunities in the territory through the funding that is made available by this prize or other fundraising initiatives. To address this, it will be necessary for the planned incorporation of the KMN organization (that will manage the smart cities and other funds) to be based in Nunavut and hire Nunavummiut, prioritizing Nunavut Land Claim beneficiaries. At the same time - the KMN will fulfill its role to support training for local staff and integrate capacity building through its services.

Risks

This is a project of immense magnitude that is faced with particular obstacles in terms of access to technology, distance, and human resources to coordinate communications and engagement. Below is a description of some of the major risks we have identified for engagement, along with the mitigation strategies we will be incorporating:

Restricted Communication Channels: Every community and every individual experiences things differently and no one mode of communication can be taken for granted. Our teams understands the value of a multi communications approach and will focus on ensuring engagement can be done equally through community radio, social media, email newsletters, and personal engagement, with a priority on written and verbal content in Inuktitut.

Distance and Travel: Travel to each of the 25 communities is incredibly expensive for anyone in the territory. While engagement will be ongoing and regular with a budget for necessary travel from a base in Iqaluit, this project prioritizes a community-led approach supported with training and digital communications to collaborate and achieve results.

High Turnover/Skills Capacity: Staff Turnover in Nunavut is always high as people move from opportunity to opportunity. Maintaining consistent staff and building capacity in each community to see these projects through will be a constant challenge. Throughout the proposal, our approach includes training and capacity building for both participants and staff through a 'Train the Trainer' model - and budgets to prioritize well paid employment opportunities.

Feedback integration: Consultation and engagement yield important feedback for project managers and leaders to consider - yet there is always a risk that feedback provided won't be incorporated into project design and implementation. We will strengthen a community-led process, with individual Hamlets, local organizations and community members as the ultimate decision makers with the power to integrate aspects of the proposal that have not been considered.

Chapter 8: Implementation

The jurisdiction of this entry into the Smart Cities Challenge is governed by the the Nunavut Land Claims Agreement and represents an Inuit population of 84%. This section will lay out how the implementation of this initiative will be built in alignment with the articles of the Nunavut Lands Claim Agreement, alongside the values of Inuit Qaujimajatuqangit. The principals themselves are intuitively compatible with duties to consult, employment benefits and respect for the land through a process that complies with all our requirements under global, federal, territorial, municipal and Inuit law.

Duty To Consult with Indigenous Groups

As detailed in Chapter 6 on Engagement, the duty of the Katinnganiq proposal to consult with our communities is a central piece for the implementation of the project. NAM, as the lead proponent for this initiative is key. The group provides a single voice for mayors and municipal administrators of the territory's 25 communities. NAM leads this duty to consult at the highest level, working daily with municipal leaders on every decision and soliciting feedback throughout the process. The association was formed to make important contributions to decisions about Nunavut communities and capital projects, with Katinnganiq fitting naturally into that discussion. As noted in the Engagement chapter, we lean heavily on Aajiqatigiinniq (decision making through discussion and consensus) which means that the duty to consult extends beyond just this initial phase of the development of a proposal and is a core value that spans the entire project.

Modern Treaty Obligations

Nunavut sits on the largest settled land claim in the entire world. The respect for the terms of that land claims agreement will be a core tenet of the implementation phase. Given the size and scope of this proposed project and the source of the funding, this project as a whole and the proposed KMN organization in particular will adhere to the articles of the

Nunavut Land Claims Agreement⁵⁹ as they relate to the project's implementation. There are certain obligations under the NLCA that are relevant to this project. They include;

Article 23: Inuit Employment Within Government⁶⁰: While this article directly relates to employment within the Government, Katinnganiq is committed to support and encourage a workforce that is reflective of the population it serves by prioritizing Inuit in leadership positions and building capacity for emerging and young leaders. We will develop an Inuit employment plan that specifically focuses on training and support in the ICT sector, along with training in administration, bookkeeping, management and program facilitation - with both digital materials and in-person delivery.

In addition to the types of education and employment plans that stakeholders organizations in this project already have in place, we developed employment strategies modeled on the Government of Nunavut's own hiring policies which put priority on Inuit hiring and are rooted in Part 4 and 5 of Article 23 of the Inuit Employment Plan.

Article 24: Government Contracts⁶¹: This Article will govern how the KMN project commits to administering and distributing any government funds. We will actively seek out and encourage Inuit firm involvement as primary partners in delivery, and support local businesses. While much of the NLCA is designed to discuss the interaction between Inuit and various levels of Government, the spirit of the agreement remains relevant and vital to what we are aiming to do. Respect for the NLCA in the implementation of the Katinnganiq project is paramount.

Community Employment Benefit

Implementation of this initiative will adhere to and complement the CEB as outlined by Infrastructure Canada. Our implementation of the Nunavut Land claims Agreement will address both employment and procurement opportunities for Indigenous peoples (specifically Inuit) and Inuit firms throughout the life of this project. At the same time, we will encourage and support the participation of women (and Inuit women in particular) in leadership positions influencing both the design, management and delivery of programs.

At the same time, our proposal carries with it a strong emphasis on capacity building programs for youth, which will be more concretely integrated into career opportunities through internships programs with the KMN and within each community. The Pinnguaq Association will support internships (where applicable and in-line with eligibility criteria) through the delivery of the Digital Skills for Youth internship wage-matching program it administers on behalf of ISED. Other wage-subsidy programs (like those that exist as part of Canada's Youth Employment Strategy, and the Kakivak Association), will be sought after to support internships, mentorships, apprenticeships and youth leadership.

With at least 5 staff positions at the KMN not for profit, and 2 positions at each Makerspace, along with possible interns, this initiative has the potential to create a significant amount of employment opportunities and economic development in the territory. While the

⁵⁹ "Nunavut Agreement." *Nunavut Tunngavik Incorporated*. N.p., n.d. Web. 12 Dec. 2018. <<https://nlca.tunngavik.com/>>

⁶⁰ "Nunavut Agreement: Article 23." *Nunavut Tunngavik Incorporated*. N.p., n.d. Web. 12 Dec. 2018. <https://nlca.tunngavik.com/?page_id=2301>

⁶¹ "Nunavut Agreement: Article 24." *Nunavut Tunngavik Incorporated*. N.p., n.d. Web. 12 Dec. 2018. <https://nlca.tunngavik.com/?page_id=2366>

Makerspace and te(a)ch program both host content targeted at adults, it is designed with K-12 youth in mind. Some of the most prevalent feedback we've received in our community consultation was around the need for consistent and positive youth programming. Coupled with our focus on health and wellness, this project is well positioned to provide that.

The very existence of the proposed program and the infrastructure it will create serves as a boon to small and medium businesses, as well as social enterprises. Already in the six months since the Iqaluit Makerspace opened we have welcomed in small businesses and shared both what we can offer to them, but more importantly, what they can offer to our attendees. This project is about supporting the already vibrant culture of innovation in the territory.

As it relates to reporting on these statistics and the stories that accompany them, Katinnganiq is committed to expanding on them as part of the performance measurement framework outlined in Chapter 3.

Chapter 9: Financial

This chapter provides a detailed financial breakdown of a five-year implementation plan for this initiative. In serving 25 unique communities, we recognize that the prize of \$10 million dollars will not cover the costs of independently opening and sustaining fully realized makerspaces in 25 communities throughout five years. The prize of \$10 Million will be a substantive amount that will help launch this initiative, but as has been the focus throughout this proposal, the end goal we seek is one of financial sustainability beyond the timeline of this grant, predicated on a multi-level collaborative framework that breaks down silos and harnesses community, territorial and national efforts and capacities to support the outcomes of this project.

The KMN's role in this sense is key to attracting more funding from municipal, territorial, federal and private/corporate dimensions, and integrating this support while working with each community to create local capacities for the long-term maintenance of community makerspaces. With the mission to serve each community, we have included those projections into the design of a 5-year budget plan that allocates the \$10 million dollars in start up costs for both the KMN Not For Profit, as well as for 24 individual makerspaces⁶², in a phased sequence, spread out as follows:

- FY 2019-2020: KMN Not-for-profit, 4 Makerspaces
- FY 2020-2021: KMN Not-for-profit, 5 Makerspaces
- FY 2021-2022: KMN Not-for-profit, 5 Makerspaces
- FY 2022-2023: KMN Not-for-profit, 5 Makerspaces
- FY 2023-2024: KMN Not-for-profit, 5 Makerspaces

This phased approach will see implementations in each community in ways that respond to their resources, capacity and readiness, with the KMN allocating the funds accordingly. In this budget, estimates are allocated each year to a group of 4 or 5

⁶² The Iqaluit Makerspace has not been budgeted for because start-up funds have already been directed to it from the preliminary application grant, and though it will remain part of the Katinnganiq Makerspace Network, it will be managed and funded by the Pinnguaq Association.

communities (depending on the year) for start up costs, with the projection that in subsequent years, Makerspaces will be running with additional funding provided collectively by local municipalities, a local organization, as well as by KMN funds obtained through additional fundraising efforts beyond that of this prize. The estimates included in this budget are based on the following assumptions:

Salaries

Due to the high cost of living in Nunavut (high housing rents, high cost of food, and high utility costs), an average salary in Nunavut needs to adequately reflect a living wage. According to [payscale.com](https://www.payscale.com/research/CA/Location=Iqaluit-Nunavut/Salary) an average salary in Nunavut is \$72,715⁶³, while an average salary at the GN is \$99,000⁶⁴ (not including staff housing). To remain competitive, KMN and local Makerspace salaries are budgeted to receive market rate salaries that correspond with their duties and responsibilities, and their respective FT or PT commitments. For the first year, salaries have been prorated with the assumption of a September start date

KMN Operations Manual

As a new not-for-profit organization providing ongoing support, the development of an operations manual will be an essential tool for its success, and the success of local Makerspaces. It will outline managerial, financial, and administrative processes, develop statement of values, ethics and operating principles, internal and human resources policies, and others as outlined in the project management chapter. We have budgeted \$30,000 in smart cities award costs to hire an experienced consulting firm, along with \$20,000 in in-kind labour from the 4 collaborating organizations to produce these deliverables in a reasonable timeframe.

Rent and Utilities

Though office space in most urban centers is high, the context in Nunavut also includes the added challenge of scarcity. Available spaces are scarce, and as much as we will work to combine resources wherever possible, we have projected an annual rent of \$60,000.00 (or a monthly fee of \$5,000.00) in each community (based on the rent paid for the Iqaluit Makerspace from August 2018 to February 2019). For the first year, rent and

⁶³ "Average Salary in Iqaluit, Nunavut, Canada." *PayScale*. N.p., n.d. Web. 27 Feb. 2019. <<https://www.payscale.com/research/CA/Location=Iqaluit-Nunavut/Salary>>

⁶⁴ "Average Government of Nunavut Salary." *PayScale*. N.p., n.d. Web. 27 Feb. 2019. <https://www.payscale.com/research/CA/Employer=Government_of_Nunavut/Salary>

utilities costs have been prorated to 75% of the full costs to account for the timing of Makerspace deployment in the late summer, early fall.

Internet

The internet context in Nunavut has been addressed throughout this proposal and more specifically in the technology chapter. Independent of our initiatives, each makerspace will offer a wireless internet connection purchased by one of the Internet Service Providers available in each community. For example, SSi Micro/Qiniq offers Internet Plans in every community of 150Gb at 5Mbps for a monthly fee of \$399.00, before tax; and over usage prices of \$120 per 10Gb. Northwestel is not available in every community just yet, but are mandated to offer their services in all communities by the end of 2019 through Telesat's new Ka-band high throughput satellite. Right now, in Cambridge Bay or Iqaluit for example, their monthly plans for 100Gb are priced at \$129/month before tax, with over usage fees at an extra \$4/Gb. We have budgeted an average annual fee of \$4,800 (or \$400 monthly) for enough bandwidth to support Makerspace users in each community. Though we see these fees adapting with the changing connectivity landscape over the next few years.

Travel

Travel to and within the territories is prohibitively expensive. Nunavut's land area is 1,936,113 sq. km (or 20% of Canada's land mass), with 25 fly-in only communities. For example, one return flight from Iqaluit to Ottawa in September of 2019 costs, at the lowest price, \$1,585.00⁶⁵. Airfare from Iqaluit to Cambridge Bay costs approx \$3,448.00 and a ticket from Cambridge Bay to Kugluktuk is priced at \$1,704.00. An annual budget of \$50,000 for the KMN Not-for-profit will be able to support consultation, implementation and performance measurement.

Evaluation

Evaluation is a key aspect of measuring the performance and outcomes of this initiative. We have budgeted for a bi-annual independent evaluation to be undertaken in accordance with funder requirements to assess the performance of this initiative as a whole. Simultaneously, in the first year we have budgeted \$25,000.00 for the development of a comprehensive evaluation framework that will work with communities to further develop the key performance indicators that have been set out in this proposal, along with the development of the evaluations tools and materials appropriate to this context.

At the same time we have budgeted annually to carry out data collection, analysis and reporting

Curriculum Development, Facilitation and Training

⁶⁵ Flights priced through Expedia.ca on February 27, 2019 for travel between September 17 - 29, 2019.

Much of the curriculum development involved in this initiative has and is being produced by the Pinnguaq Association, with funding confirmed from other granting programs (such as ISED's CanCode and Digital Literacy Exchange Programs), as well as through support from various partners. As the curriculum and learning resources are expanded to serve this project and each community's needs, we anticipate that there will be a need to adapt and create materials that respond to a specific demand. With a focus on digital literacy for adults as well as Elder-led curriculum, Pinnguaq will leverage its resources to support this initiative - while responding to the demand of its services with smart cities funds where needed through nominal fees.

The Embrace Life Council staff will provide training in ASIST and Trauma-informed practice for Makerspace staff. Based on their registration and facilitation fees, we have budgeted \$5,000 per training session, per community.

KMN Digital Network Architecture

The development and deployment of the Network Architecture has been quoted at \$70,000.00 for its development and deployment, with an additional \$10,000.00 quoted for the preparation of curriculum and learning materials regarding its management and maintenance.

Startup Materials

Each Makerspace will require a set of startup materials to run its programs. With the assistance of programs like Computer for Success Nunavut, Computers for Success Canada, and Computers for Schools we can provide in-kind refurbished government laptops to each space. A selection of additional materials that will be essential for running programs include high capacity desktops, VR headsets, VR Camera, high end 3D printer, 3D scanner, inkjet printer/cutter, document cameras, speakers, DSLR cameras, video cameras, speakers, art supplies, hand and carving tools, books, robotics tools (dash and dot), and electronic learning materials (Makey Makey sets, Lego Mindstorms, Elenco Snap Circuits, MicroBits, Raspberry Pi's, and Arduino, along with other basic materials, like conductive thread, wires, LED lights, etc). With a budget of \$40,000 for start up costs, each community space, with assistance from KMN can procure the tools and materials that are right for them.

Internet Exchange Points (Arctic Internet Exchange)

The cost of an IXP Nunavut is primary based on the accessibility to a data centre. If the GN or one of the ISPs (Northwestel or SSI Micro) will donate or rent Arctic Internet Exchange space in their data centre, the setup costs can be as little as \$10,000 in each community. If a data centre is required, the most cost effective option will be one of Nuvujaq's 2 data centres, which will cost roughly \$200K including installation. Nuvujaq will have a data centre in Iqaluit (funded through other means) this spring and has another data centre available to deploy in the community makerspace. At the same time, the

equipment needed to setup an IXP at a data centre (1 switch, 2 routers) is priced at \$10,000 for each setup. Additional IXP setup labour and training delivery will cost \$10,000 per instalment.

Other Sources of Funding

The Finance Committee of the KMN Board, along with the Executive Director, the Finance Director, and the Development Coordinator the KMN will be an organization capable of fundraising to further support this mission at the federal, and territorial levels, while also working with the private sector. Expressions of interest from non-government funders have been positive. We have had a positive rapport with the Internet Society and CIRA, both of whom have funding programs. We have relationships with Google and Microsoft, and will also be pursuing funding from RBC Future launch and TD Ready Commitment. We will also be pursuing wage matching internship programs from Kavikak Association, or the Digital Skills for Youth program (administered by Pinnguaq association) and the Technical Work Experience Program (TWEP), which is administered by Computers for Schools (CFS) and part of Canada's Youth Employment Strategy.

In general, with funding for a Finance director and fundraiser, we will be utilizing an accrual method of account, performing annual audits, and building a fundraising campaign to further sustain this initiative beyond lifetime of this grant.

Risks

The major financial risks of this project rests in being able to secure the support from other sources of funding to be able to provide a sustainable path forward for each community makerspace. The mitigation strategy for this major risk factor is addressed throughout this proposal, and it includes a strong vision, governance framework, and project management strategy (including performance measurement) that builds in costs for fundraising and development. The strong leadership and management of the KMN will centralize fundraising to further support local Makerspaces, while also assisting in applying for and sourcing funding at the local level.

Finalist Grant

Smart Cities Challenge		Report on \$250K Grant to March 2018	
	Total	Details	
Outreach Coordinator Salary			
Outreach Coordinator Salary	\$38,000	Chelsea Singooriee/Nunabox Media	
Subtotal	\$38,000		
Outreach + Consultation			

Room booking fees, door prizes, snacks + refreshments for community sessions + live interpretation fees	\$3,120	<i>Bookings and Cancellation fees at Pond Inlet, Pangnirtung and Qikiqtarjuaq</i>
Subtotal	\$3,120	

Travel, Accomodations, Per Diems		
Travel to Iqaluit, Pond Inlet, Pangnirtung, Qikiqtarjuaq communities for outreach	\$11,380	<i>Team of 2 people</i>
Travel to Jury Presentation	\$4,200	<i>Pinnguaq, ELC, + QHRC (1 rep each)</i>
Travel to NAM AGM	\$6,800	<i>Team of 2.5 (1.5 of team financed through Pinnguaq)</i>
Travel to Arviat for Curriculum Development consultation	\$5,000	<i>(some additional fees also supported by Pinnguaq)</i>
Travel to Ottawa for CIRA/IXP meeting	\$2,925	<i>Team of 2 (Pinnguaq + QHRC)</i>
Subtotal	\$30,305	

Marketing		
Website	\$4,000	
Branding	\$1,500	<i>Nunavut Artist hired for logo design</i>
Communications/Advertising/Design	\$2,800	
Subtotal	\$8,300	

Translation		
Translation of project brief	\$1,200	
Translation of press release	\$1,200	
Translation of preliminary proposal	\$3,475	
Translation of brochures, website and other outreach material	\$2,600	
Translation of Final Proposal and Video	\$7,000	<i>Budget for Translation to be done after March 5th</i>
Subtotal	\$15,475	

Pilot of Mesh Network		
Equipment	\$3,000	
Research		<i>in-kind Fleming Student project</i>
Coordination of Fleming students	\$2,000	
Subtotal	\$5,000	

Administration		
Administration overhead	\$27,000	\$6,750 for each of the four partner organizations
Advisory committee	\$2,800	\$200 fee per meeting per Advisory Committee Member (7 members total)
Subtotal	\$29,800	
Final Proposal Development		
Research and Proposal Development labour	\$30,000	
3rd Party Consultants fee	\$30,000	Hired Consultant Team
Subtotal	\$60,000	
Makerspace Pilot		
Rent, Utilities	\$30,000	\$5,000 a month for 6 months
Basic furnishings		Pinnguaq in-kind
Hardware (computers)		Pinnguaq in-kind
Staff Salaries contribution	\$30,000	Pinnguaq supported most salary costs in-kind
Software/Tools		Pinnguaq in-kind
Subtotal	\$60,000	
TOTAL	\$250,000	

The months of preparing this proposal with support of the finalist funding was a mix of practical research and development, along with the installment of a pilot Makerspace in Iqaluit, and travel and consultation. The \$250,000 provided for the finalist phase was used consistently with the budget proposed with one major change, and adjustments for actual scope of expenditures. The major adjustment was in the redirection of funds budgeted for mesh network research and implementation, to the hiring of a consultant firm to assist in the writing of the final proposal. What follows is a description of the funds that were spent.

Outreach Coordinator: \$38,000

An outreach coordinator for the project was hired in early November 2018, bringing on Chelsea Singoorie of Nunabox Media to the project. Chelsea, a trilingual Inuk from Pond Inlet brought a knowledge of not only the communities we were visiting as apart of this project but

also extensive community development experience through her experiences with Nunabox. Chelsea travelled across Nunavut hosting consultations and helping craft the final project based on the feedback of those we met with.

Outreach and Consultation: \$3,120

Originally, a budget line of \$15,000 was created specifically to provide funding for participation in our consultation. This included to pay for room bookings, the purchase of prize giveaways for our consultations and honorarium for specific consultations. Creating incentives for participation is a standard practice in Nunavut consultation and this budget was expended in that fashion, however, it was significantly reduced due to the limited time for travel, concurrent with the writing of this application for our staff.

Travel: \$30,305

Nunavut is the most expensive place to travel in Canada, with some community visits running close to \$10,000 for a two day session. The \$40,000 in the travel that was originally budgeted was reduced due to reduced travel and the combination of additional funding through Pinnguaq's te(a)ch program to consultation and te(a)ch workshops. We ended up being able to visit;

- Pangnirtung
- Pond Inlet
- Arviat and;
- Cambridge Bay

It also included funding for Katinnganiq members to consult at major meetings in Ottawa and Toronto both with the purpose of bringing on additional partnerships to help compliment the initiative.

Marketing: \$8,300

Promotion of the initiative was vital throughout the process and this included the development of a website, a new logo for the initiative and Facebook/social media outreach. Facebook is the most popular form of communications in Nunavut and the purchase of advertising through the service was a key part of spreading the word to those that could not attend.

Translation: \$15,475

Our primary audience for this project is Inuktitut speaking and a \$14,000 translation budget was created to ensure that all project materials are available in Inuktitut. Our news, alerts, project briefs and project proposal documents are all translated and available in English/Inuktitut, as is the website.

Pilot of the Mesh Network: \$5,000

Pinnguaq partnered directly with Sir Sanford Fleming College in Peterborough, Ontario to bring on four students of the Wireless Network Technology program to explore Mesh Networks. These students, along with staff from Pinnguaq, conducted research on Mesh Networks, and some experiments to determine the value of bringing Mesh Networks to this project.

As is explored in this proposal, this research, along with input and expertise from Nunageek Solutions Inc and Nuvujaq, ultimately highlighted the flaws on any heavy reliance on Mesh Network in this proposal and this is why it has been scaled down so significantly.

Administration: \$29,800

An Administration budget was created to cover the costs of the four key organizations involved. Nunavut Association of Municipalities, Qaujigiartiit Health Research Centre, Embrace Life Council and Pinnguaq all received \$6,750.00 each to help cover administration of the project. Another \$2,800 was put aside for the Advisory Committee to support their involvement.

Research and Final Proposal Development: \$60,000

This funding covered the actual writing of the proposal. This primarily was absorbed in wages but also in the hiring of the consultant firm Nordicity who came on to help finalize the proposal.

Pilot Makerspace: \$60,000

\$60,000 was provided to the Pinnguaq Iqaluit Makerspace to help cover the costs of operating the space in 2018/2019 as apart of the pilot project. This included rent, utilities and wage subsidies. The space helped shape the direction of this project more than any other individual initiative. Pinnguaq contributed an additional costs for salaries, furniture, and materials between September 2018 and March 2019 to support the staff and the space itself.

6. Budget FY 2019-2020

a) KMN

Labour and Salaries

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
1	Executive Director	1 FTE	\$45,000.00	KMN	\$45,000.00		\$45,000.00
1	Financial Director/Fundraiser	1 PTF	\$45,000.00	KMN	\$45,000.00		\$45,000.00
1	IT Manager(Data Center/IXP/KMN Digital Platform)	1 FTE	\$45,000.00	KMN	\$45,000.00		\$45,000.00
1	Content/Curriculum Development Manager	1 PTE	\$45,000.00	KMN	\$45,000.00		\$45,000.00
1	Outreach and Engagement Coordinator	1 PTE	\$25,000.00	KMN	\$25,000.00		\$25,000.00
Subtotal Labour and Salaries					\$205,000.00	\$0.00	\$205,000.00

Assuming September 2019 Start Date

Assuming September 2019 Start Date

Assuming September 2019 Start Date

Assuming September 2019 Start Date

Assuming September 2019 Start Date

Materials

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
1	Operations Manual	Documents on processes, agreements, charter, non-profit registrations, internal policies	\$50,000.00	KMN/Consultant	\$30,000.00	\$20,000.00	\$50,000.00
1	Network Manual	Development of network training manual	\$10,000.00	Pinnguaq	\$10,000.00		\$10,000.00
							\$0.00
							\$0.00
							\$0.00
Subtotal Materials					\$40,000.00	\$20,000.00	\$60,000.00

In Kind contribution from all partners + consultant fees

Subcontracts and Consultants

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
1	Curriculum Development	Adult learning, and Elder-led curriculum	\$200,000.00	Pinnguaq	\$50,000.00	\$150,000.00	\$200,000.00
1	Evaluation Framework	Further development of indicators and development of materials	\$25,000.00	QHRC	\$25,000.00		\$25,000.00

in-kind from Pinnguaq

1	KMN Digital Network Architecture	Development of Network Architecture (user accounts, user forum, network storage, local source control repository)	\$60,000.00	Pinnguaq	\$60,000.00		\$60,000.00
Subtotal Subcontracts and Consultants					\$135,000.00	\$150,000.00	\$285,000.00

Administration

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
1	Office Space Rent	Annual Rent for a space shared with the Iqaluit Makerspace	\$76,800.00	KMN/Pinnguaq	\$24,000.00	\$52,800.00	\$76,800.00
1	Internet Connection	annual cost	\$1,800.00	KMN	\$1,800.00		\$1,800.00
1	Office Supplies	annual cost	\$1,000.00	KMN	\$1,000.00		\$1,000.00
1	Performance Evaluation	Data collection and KPI measurements	\$65,000.00	KMN/QHRC	\$65,000.00		\$65,000.00
Subtotal Administration					\$91,800.00	\$52,800.00	\$144,600.00

in-kind from Pinnguaq

Instructor Training or Professional Development

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
Subtotal Instructor Training or Professional Development					\$0.00	\$0.00	\$0.00

Other Costs

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
	Travel	Travel to communities for consultation and implementation	\$50,000.00		\$50,000.00		\$50,000.00
Subtotal Other Costs					\$50,000.00	\$0.00	\$50,000.00

KMN SUBTOTAL \$521,800.00 \$222,800.00 \$744,600.00

b) Community Makerspace

Labour and Salaries

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
4	Executive Director	1 FTE at each local Makerspace (5 in a year)	\$45,000.00	KMN-L	\$180,000.00		\$180,000.00
4	Program Facilitator/Head Instructor	1 FTE at each local Makerspace (5 in a year)	\$40,000.00	KMN-L	\$160,000.00		\$160,000.00
Subtotal Labour and Salaries					\$340,000.00	\$0.00	\$340,000.00

Assuming September 2019 Start Date

Assuming September 2019 Start Date

Materials

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
4	Startup Materials	(High capacity desktops, Basic Furnishings, Art Supplies, Robotics Tools, VR equipment, books, 3D printer, etc) list to be compiled collaboratively with each makerspace	\$35,000.00	KMN-L	\$140,000.00		\$140,000.00
4	Laptops (set of 25)	CFS laptops for Makerspaces	\$10,000.00	CFS		\$40,000.00	\$40,000.00
2	Nuvujaq Data Centers		\$200,000.00	Nuvujaq		\$400,000.00	\$400,000.00
3	Space rental on Existing Data Center	Rented on Northwestel/Ssi Micro/Nuvujaq data centers	\$10,000.00	Nuvujaq	\$30,000.00	\$0.00	\$30,000.00
5	IXP equipment (1 Switch, 2 router servers)		\$10,000.00	Nuvujaq	\$50,000.00		\$50,000.00
Subtotal Materials					\$220,000.00	\$440,000.00	\$660,000.00

In kind from Computer for Success Nunavut (CFS)

in-Kind from Nuvujaq

Subcontracts and Consultants

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
Subtotal Subcontracts and Consultants					\$0.00	\$0.00	\$0.00

Administration

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
4	Rent	Annual costs	\$40,000.00	KMN-L	\$160,000.00		\$160,000.00
4	Heating	Annual costs	\$3,000.00	KMN-L	\$12,000.00		\$12,000.00
4	Electricity	Annual costs	\$1,500.00	KMN-L	\$6,000.00		\$6,000.00
4	Internet	Annual costs	\$3,500.00	KMN-L	\$14,000.00		\$14,000.00
Subtotal Administration					\$192,000.00	\$0.00	\$192,000.00

Instructor Training or Professional Development

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
4	Admin/Management /Financial		\$6,000.00	KMN	\$24,000.00		\$24,000.00
4	Te(a)ch facilitation training		\$15,000.00	Pinnguaq	\$40,000.00	\$20,000.00	\$60,000.00
4	ASIST Training		\$5,000.00	Embrace Life Council	\$20,000.00		\$20,000.00
4	Trauma-informed practice Training		\$5,000.00	Embrace Life Council	\$20,000.00		\$20,000.00
4	KMN Digital Network Setup & Training program		\$10,000.00	Pinnguaq	\$40,000.00		\$40,000.00
5	IXP Setup and Training program		\$10,000.00	Nuvujaq	\$40,000.00	\$10,000.00	\$50,000.00
Subtotal Instructor Training or Professional Development					\$184,000.00	\$30,000.00	\$214,000.00

in-kind from Pinnguaq

Other Costs

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
Subtotal Other Costs					\$0.00	\$0.00	\$0.00

Community Makerspace SUBTOTAL **\$936,000.00** **\$470,000.00** **\$1,406,000.00**

Project Budget TOTAL (FY 2019-2020)			\$1,457,800.00	\$692,800.00	\$2,150,600.00
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Project Budget Total Year to Date			\$1,457,800.00	\$692,800.00	\$2,150,600.00
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6. Budget FY 2020-2021
a) KMN
Labour and Salaries

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
1	Executive Director	1 FTE	\$90,000.00	KMN	\$90,000.00		\$90,000.00
1	Financial Director/Fundraiser	1 PTE	\$90,000.00	KMN	\$90,000.00		\$90,000.00
1	IT Manager(Data Center/IXP/KMN Digital Platform)	1 FTE	\$90,000.00	KMN	\$90,000.00		\$90,000.00
1	Content/Curriculum Development Manager	1 PTE	\$90,000.00	KMN	\$90,000.00		\$90,000.00
1	Outreach and Engagement Coordinator	1 PTE	\$50,000.00	KMN	\$50,000.00		\$50,000.00
Subtotal Labour and Salaries					\$410,000.00	\$0.00	\$410,000.00

Materials

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
Subtotal Materials					\$0.00	\$0.00	\$0.00

Subcontracts and Consultants

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
1	Curriculum Development	Adult learning, and Elder-led curriculum	\$53,000.00	Pinnguaq	\$28,000.00	\$25,000.00	\$53,000.00
Subtotal Subcontracts and Consultants					\$28,000.00	\$25,000.00	\$53,000.00

Administration

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
1	Office Space Rent	Annual Rent for a space shared with the Iqaluit Makerspace	\$80,000.00	KMN/Pinnguaq	\$26,000.00	\$54,000.00	\$80,000.00
1	Internet Connection	annual cost	\$2,000.00	KMN	\$2,000.00		\$2,000.00
1	Office Supplies	annual cost	\$1,000.00	KMN	\$1,000.00		\$1,000.00

1	Performance Evaluation	Data collection and KPI measurements & external evaluation	\$85,000.00	KMN/QHRC	\$85,000.00		\$85,000.00
Subtotal Administration					\$114,000.00	\$54,000.00	\$168,000.00

Instructor Training or Professional Development

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
Subtotal Instructor Training or Professional Development					\$0.00	\$0.00	\$0.00

Other Costs

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
	Travel	Travel to communities for consultation and implementation	\$50,000.00		\$50,000.00		\$50,000.00
Subtotal Other Costs					\$50,000.00	\$0.00	\$50,000.00

KMN SUBTOTAL **\$602,000.00** **\$79,000.00** **\$681,000.00**

b) Community Makerspace

Labour and Salaries

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
9	Executive Director	1 FTE at each local Makerspace (5 in a year)	\$90,000.00	KMN-L	\$450,000.00	\$360,000.00	\$810,000.00
9	Program Facilitator/Head Instructor	1 FTE at each local Makerspace (5 in a year)	\$80,000.00	KMN-L	\$400,000.00	\$320,000.00	\$720,000.00
Subtotal Labour and Salaries					\$850,000.00	\$680,000.00	\$1,530,000.00

costs absorbed by KMN-L or through other sources of funding obtained by KMN

costs absorbed by KMN-L or through other sources of funding obtained by KMN

Materials

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
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5	Startup Materials	(High capacity desktops, Basic Furnishings, Art Supplies, Robotics Tools, VR equipment, books, 3D printer, etc) list to be compiled collaboratively with each makerspace	\$35,000.00	KMN-L	\$175,000.00		\$175,000.00
5	Laptops (set of 25)	CFS laptops for Makerspaces	\$10,000.00	CFS/Pinnguaq		\$50,000.00	\$50,000.00
3	Space rental on Existing Data Center	Rented on Northwestel/Ssi Micro data centers	\$10,000.00		\$30,000.00		\$30,000.00
Subtotal Materials					\$205,000.00	\$50,000.00	\$255,000.00

in-kind from CFS

Subcontracts and Consultants

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
Subtotal Subcontracts and Consultants					\$0.00	\$0.00	\$0.00

Administration

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
9	Rent	Annual costs	\$60,000.00	KMN-L	\$300,000.00	\$240,000.00	\$540,000.00
9	Heating	Annual costs	\$4,000.00	KMN-L	\$20,000.00	\$16,000.00	\$36,000.00
9	Electricity	Annual costs	\$2,000.00	KMN-L	\$10,000.00	\$8,000.00	\$18,000.00
9	Internet	Annual costs	\$4,800.00	KMN-L	\$24,000.00	\$19,200.00	\$43,200.00
Subtotal Administration					\$354,000.00	\$283,200.00	\$637,200.00

costs absorbed by KMN-L or through other sources of funding obtained by KMN

costs absorbed by KMN-L or through other sources of funding obtained by KMN

costs absorbed by KMN-L or through other sources of funding obtained by KMN

costs absorbed by KMN-L or through other sources of funding obtained by KMN

Instructor Training or Professional Development

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
5	Admin/Management/Financial		\$6,000.00	KMN	\$30,000.00		\$30,000.00
5	Te(a)ch facilitation training		\$5,000.00	Pinnguaq		\$25,000.00	\$25,000.00
5	ASIST Training		\$5,000.00	Embrace Life Council	\$25,000.00		\$25,000.00
5	Trauma-informed practice Training		\$5,000.00	Embrace Life Council	\$25,000.00		\$25,000.00

in-kind from Pinnguaq

5	KMN Digital Network Setup & Training program		\$10,000.00	Pinnguaq	\$40,000.00	\$10,000.00	\$50,000.00	in-kind from Pinnguaq
Subtotal Instructor Training or Professional Development					\$120,000.00	\$35,000.00	\$155,000.00	
Other Costs								
Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total	
Subtotal Other Costs					\$0.00	\$0.00	\$0.00	
Community Makerspace SUBTOTAL					\$1,529,000.00	\$1,048,200.00	\$2,577,200.00	
Project Budget TOTAL (FY 2020-2021)					\$2,131,000.00	\$1,127,200.00	\$3,258,200.00	
Project Budget Total Year to Date					\$3,588,800.00	\$1,820,000.00	\$5,408,800.00	

6. Budget FY 2021-2022							
a) KMN							
Labour and Salaries							
Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
1	Executive Director	1 FTE	\$90,000.00	KMN	\$90,000.00		\$90,000.00
1	Financial Director/Fundraiser	1 PTE	\$90,000.00	KMN	\$90,000.00		\$90,000.00
1	IT Manager(Data Center/IXP/KMN Digital Platform)	1 FTE	\$90,000.00	KMN	\$90,000.00		\$90,000.00
1	Content/Curriculum Development Manager	1 PTE	\$90,000.00	KMN	\$90,000.00		\$90,000.00
1	Outreach and Engagement Coordinator	1 PTE	\$50,000.00	KMN	\$50,000.00		\$50,000.00
Subtotal Labour and Salaries					\$410,000.00	\$0.00	\$410,000.00
Materials							
Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
Subtotal Materials					\$0.00	\$0.00	\$0.00
Subcontracts and Consultants							
Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
1	External Evaluation	Annual	\$30,000.00	Consultants	\$50,000.00		\$50,000.00
Subtotal Subcontracts and Consultants					\$50,000.00	\$0.00	\$50,000.00
Administration							
Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
1	Office Space Rent	Annual Rent for a space shared with the Iqaluit Makerspace	\$84,000.00	KMN/Pinnguaq	\$28,000.00	\$56,000.00	\$84,000.00
1	Internet Connection	annual cost	\$2,200.00	KMN	\$2,200.00		\$2,200.00
1	Office Supplies	annual cost	\$1,000.00	KMN	\$1,000.00		\$1,000.00

in-kind from Pinnguaq

1	Performance Evaluation	Data collection and KPI measurements & external evaluation	\$85,000.00	KMN/QHRC	\$85,000.00		\$85,000.00
Subtotal Administration					\$116,200.00	\$56,000.00	\$172,200.00

Instructor Training or Professional Development

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
Subtotal Instructor Training or Professional Development					\$0.00	\$0.00	\$0.00

Other Costs

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
	Travel	Travel to communities for consultation and implementation	\$50,000.00		\$50,000.00		\$50,000.00
Subtotal Other Costs					\$50,000.00	\$0.00	\$50,000.00

KMN SUBTOTAL **\$626,200.00** **\$56,000.00** **\$682,200.00**

b) Community Makerspace

Labour and Salaries

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
14	Executive Director	1 FTE at each local Makerspace (5 in a year)	\$90,000.00	KMN-L	\$450,000.00	\$810,000.00	\$1,260,000.00
14	Program Facilitator/Head Instructor	1 FTE at each local Makerspace (5 in a year)	\$80,000.00	KMN-L	\$400,000.00	\$720,000.00	\$1,120,000.00
Subtotal Labour and Salaries					\$850,000.00	\$1,530,000.00	\$2,380,000.00

costs absorbed by KMN-L or through other sources of funding obtained by KMN

costs absorbed by KMN-L or through other sources of funding obtained by KMN

Materials

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
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5	Startup Materials	(High capacity desktops, Basic Furnishings, Art Supplies, Robotics Tools, VR equipment, books, 3D printer, etc) list to be compiled collaboratively with each makerspace	\$35,000.00	KMN-L	\$175,000.00		\$175,000.00
5	Laptops (set of 25)	CFS laptops for Makerspaces	\$10,000.00	CFS/Pinnguaq		\$50,000.00	\$50,000.00
3	Space rental on Existing Data Center	Rented on Northwestel/Ssi Micro data centers	\$10,000.00		\$30,000.00		\$30,000.00
Subtotal Materials					\$205,000.00	\$50,000.00	\$255,000.00

in-kind from CFS

Subcontracts and Consultants

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
Subtotal Subcontracts and Consultants					\$0.00	\$0.00	\$0.00

Administration

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
14	Rent	Annual costs	\$60,000.00	KMN-L	\$300,000.00	\$540,000.00	\$840,000.00
14	Heating	Annual costs	\$4,000.00	KMN-L	\$20,000.00	\$36,000.00	\$56,000.00
14	Electricity	Annual costs	\$2,000.00	KMN-L	\$10,000.00	\$18,000.00	\$28,000.00
14	Internet	Annual costs	\$4,800.00	KMN-L	\$24,000.00	\$43,200.00	\$67,200.00
Subtotal Administration					\$354,000.00	\$637,200.00	\$991,200.00

costs absorbed by KMN-L or through other sources of funding obtained by KMN

costs absorbed by KMN-L or through other sources of funding obtained by KMN

costs absorbed by KMN-L or through other sources of funding obtained by KMN

costs absorbed by KMN-L or through other sources of funding obtained by KMN

Instructor Training or Professional Development

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
5	Admin/Management /Financial		\$6,000.00	KMN	\$30,000.00		\$30,000.00
5	Te(a)ch facilitation training		\$5,000.00	Pinnguaq		\$25,000.00	\$25,000.00
5	ASIST Training		\$5,000.00	Embrace Life Council	\$25,000.00		\$25,000.00
5	Trauma-informed practice Training		\$5,000.00	Embrace Life Council	\$25,000.00		\$25,000.00

in-kind from Pinnguaq

5	KMN Digital Network Setup & Training program		\$10,000.00	Pinnguaq	\$40,000.00	\$10,000.00	\$50,000.00	in-kind from Pinnguaq
Subtotal Instructor Training or Professional Development					\$120,000.00	\$35,000.00	\$155,000.00	
Other Costs								
Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total	
Subtotal Other Costs					\$0.00	\$0.00	\$0.00	
Community Makerspace SUBTOTAL					\$1,529,000.00	\$2,252,200.00	\$3,781,200.00	
Project Budget TOTAL (FY 2021-2022)					\$2,155,200.00	\$2,308,200.00	\$4,463,400.00	
Project Budget Total Year to Date					\$5,744,000.00	\$4,128,200.00	\$9,872,200.00	

6. Budget FY 2022-2023
a) KMN
Labour and Salaries

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
1	Executive Director	1 FTE	\$90,000.00	KMN	\$90,000.00		\$90,000.00
1	Financial Director/Fundraiser	1 PTE	\$90,000.00	KMN	\$90,000.00		\$90,000.00
1	IT Manager(Data Center/XP/KMN Digital Platform)	1 FTE	\$90,000.00	KMN	\$90,000.00		\$90,000.00
1	Content/Curriculum Development Manager	1 PTE	\$90,000.00	KMN	\$90,000.00		\$90,000.00
1	Outreach and Engagement Coordinator	1 PTE	\$50,000.00	KMN	\$50,000.00		\$50,000.00
Subtotal Labour and Salaries					\$410,000.00	\$0.00	\$410,000.00

Materials

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
Subtotal Materials					\$0.00	\$0.00	\$0.00

Subcontracts and Consultants

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
Subtotal Subcontracts and Consultants					\$0.00	\$0.00	\$0.00

Administration

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
1	Office Space Rent	Annual Rent for a space shared with the Iqaluit Makerspace	\$88,000.00	KMN/Pinnguaq	\$30,000.00	\$58,000.00	\$88,000.00
1	Internet Connection	annual cost	\$2,400.00	KMN	\$2,400.00		\$2,400.00
1	Office Supplies	annual cost	\$1,000.00	KMN	\$1,000.00		\$1,000.00

in-kind from Pinnguaq

1	Performance Evaluation	Data collection and KPI measurements, and external evaluation	\$85,000.00	KMN/QHRC	\$85,000.00		\$85,000.00
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Subtotal Administration					\$118,400.00	\$58,000.00	\$176,400.00
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Instructor Training or Professional Development

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total

Subtotal Instructor Training or Professional Development					\$0.00	\$0.00	\$0.00
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Other Costs

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
	Travel	Travel to communities for consultation and implementation	\$50,000.00		\$50,000.00		\$50,000.00

Subtotal Other Costs					\$50,000.00	\$0.00	\$50,000.00
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KMN SUBTOTAL					\$578,400.00	\$58,000.00	\$636,400.00
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b) Community Makerspace

Labour and Salaries

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
19	Executive Director	1 FTE at each local Makerspace (5 in a year)	\$90,000.00	KMN-L	\$450,000.00	\$1,260,000.00	\$1,710,000.00
19	Program Facilitator/Head Instructor	1 FTE at each local Makerspace (5 in a year)	\$80,000.00	KMN-L	\$400,000.00	\$1,120,000.00	\$1,520,000.00
Subtotal Labour and Salaries					\$850,000.00	\$2,380,000.00	\$3,230,000.00

costs absorbed by KMN-L or through other sources of funding obtained by KMN

costs absorbed by KMN-L or through other sources of funding obtained by KMN

Materials

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
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5	Startup Materials	(High capacity desktops, Basic Furnishings, Art Supplies, Robotics Tools, VR equipment, books, 3D printer, etc) list to be compiled collaboratively with each makerspace	\$35,000.00	KMN-L	\$175,000.00		\$175,000.00
5	Laptops (set of 25)	CFS laptops for Makerspaces	\$10,000.00	CFS/Pinnguaq		\$50,000.00	\$50,000.00
3	Space rental on Existing Data Center	Rented on Northwestel/Ssi Micro data centers	\$10,000.00		\$30,000.00		\$30,000.00
Subtotal Materials					\$205,000.00	\$50,000.00	\$255,000.00

in-kind from CFS

Subcontracts and Consultants

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
Subtotal Subcontracts and Consultants					\$0.00	\$0.00	\$0.00

Administration

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
19	Rent	Annual costs	\$60,000.00	KMN-L	\$300,000.00	\$840,000.00	\$1,140,000.00
19	Heating	Annual costs	\$4,000.00	KMN-L	\$20,000.00	\$56,000.00	\$76,000.00
19	Electricity	Annual costs	\$2,000.00	KMN-L	\$10,000.00	\$28,000.00	\$38,000.00
19	Internet	Annual costs	\$4,800.00	KMN-L	\$24,000.00	\$67,200.00	\$91,200.00
Subtotal Administration					\$354,000.00	\$991,200.00	\$1,345,200.00

costs absorbed by KMN-L or through other sources of funding obtained by KMN

costs absorbed by KMN-L or through other sources of funding obtained by KMN

costs absorbed by KMN-L or through other sources of funding obtained by KMN

costs absorbed by KMN-L or through other sources of funding obtained by KMN

Instructor Training or Professional Development

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
5	Admin/Management /Financial		\$6,000.00	KMN	\$30,000.00		\$30,000.00
5	Te(a)ch facilitation training		\$5,000.00	Pinnguaq		\$25,000.00	\$25,000.00
5	ASIST Training		\$5,000.00	Embrace Life Council	\$25,000.00		\$25,000.00
5	Trauma-informed practice Training		\$5,000.00	Embrace Life Council	\$25,000.00		\$25,000.00

in-kind from Pinnguaq

5	KMN Digital Network Setup & Training program		\$10,000.00	Pinnguaq	\$40,000.00	\$10,000.00	\$50,000.00	in-kind from Pinnguaq
Subtotal Instructor Training or Professional Development					\$120,000.00	\$35,000.00	\$155,000.00	
Other Costs								
Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total	
Subtotal Other Costs					\$0.00	\$0.00	\$0.00	
Community Makerspace SUBTOTAL					\$1,529,000.00	\$3,456,200.00	\$4,985,200.00	
Project Budget TOTAL (FY 2022-2023)					\$2,107,400.00	\$3,514,200.00	\$5,621,600.00	
Project Budget Total Year to Date					\$7,851,400.00	\$7,642,400.00	\$15,493,800.00	

6. Budget FY 2023-2024

a) KMN

Labour and Salaries

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total	Notes
1	Executive Director	1 FTE	\$90,000.00	KMN	\$90,000.00		\$90,000.00	
1	Financial Director/Fundraiser	1 PTE	\$90,000.00	KMN	\$90,000.00		\$90,000.00	
1	IT Manager(Data Center/IXP/KMN Digital Platform)	1 FTE	\$90,000.00	KMN	\$90,000.00		\$90,000.00	
1	Content/Curriculum Development Manager	1 PTE	\$90,000.00	KMN	\$90,000.00		\$90,000.00	
1	Outreach and Engagement	1 PTE	\$50,000.00	KMN	\$50,000.00		\$50,000.00	
Subtotal Labour and Salaries					\$410,000.00	\$0.00	\$410,000.00	

Materials

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
Subtotal Materials					\$0.00	\$0.00	\$0.00

Subcontracts and Consultants

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
1	External Evaluation	Annual	\$30,000.00	Consultants	\$50,000.00		\$50,000.00
Subtotal Subcontracts and Consultants					\$50,000.00	\$0.00	\$50,000.00

Administration

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
1	Office Space Rent	Annual Rent for a space shared with the Iqaluit Makerspace	\$90,000.00	KMN/Pinnguaq	\$31,000.00	\$59,000.00	\$90,000.00
1	Internet Connection	Annual cost	\$2,600.00	KMN	\$2,600.00		\$2,600.00
1	Office Supplies	Annual cost	\$1,000.00	KMN	\$1,000.00		\$1,000.00
1	Performance Evaluation	Data collection and KPI measurements and external evaluation	\$85,000.00	KMN/QHRC	\$85,000.00		\$85,000.00

in-kind from Pinnguaq

Subtotal Administration					\$119,600.00	\$59,000.00	\$178,600.00
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Instructor Training or Professional Development

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
Subtotal Instructor Training or Professional Development					\$0.00	\$0.00	\$0.00

Other Costs

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
	Travel	Travel to communities for consultation and implementation	\$50,000.00		\$50,000.00		\$50,000.00
Subtotal Other Costs					\$50,000.00	\$0.00	\$50,000.00

KMN SUBTOTAL					\$629,600.00	\$59,000.00	\$688,600.00
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b) Community Makerspace

Labour and Salaries

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
24	Executive Director	1 FTE at each local Makerspace (5 in a year)	\$90,000.00	KMN-L	\$450,000.00	\$1,710,000.00	\$2,160,000.00
24	Program Facilitator/Head Instructor	1 FTE at each local Makerspace (5 in a year)	\$80,000.00	KMN-L	\$400,000.00	\$1,520,000.00	\$1,920,000.00
Subtotal Labour and Salaries					\$850,000.00	\$3,230,000.00	\$4,080,000.00

costs absorbed by KMN-L or through other sources of funding obtained by KMN

costs absorbed by KMN-L or through other sources of funding obtained by KMN

Materials

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
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5	Startup Materials	(High capacity desktops, Basic Furnishings, Art Supplies, Robotics Tools, VR equipment, books, 3D printer, etc) list to be compiled collaboratively with each makerspace	\$35,000.00	KMN-L	\$175,000.00		\$175,000.00
5	Laptops (set of 25)	CFS laptops for Makerspaces	\$10,000.00	CFS/Pinnguaq		\$50,000.00	\$50,000.00
3	Space rental on Existing Data Center	Rented on Northwestel/Ssi Micro data centers	\$10,000.00		\$30,000.00		\$30,000.00
Subtotal Materials					\$205,000.00	\$50,000.00	\$255,000.00

in-kind from CFS

Subcontracts and Consultants

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
Subtotal Subcontracts and Consultants					\$0.00	\$0.00	\$0.00

Administration

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
24	Rent	Annual costs	\$60,000.00	KMN-L	\$300,000.00	\$1,140,000.00	\$1,440,000.00
24	Heating	Annual costs	\$4,000.00	KMN-L	\$20,000.00	\$76,000.00	\$96,000.00
24	Electricity	Annual costs	\$2,000.00	KMN-L	\$10,000.00	\$38,000.00	\$48,000.00
24	Internet	Annual costs	\$4,800.00	KMN-L	\$24,000.00	\$91,200.00	\$115,200.00
Subtotal Administration					\$354,000.00	\$1,345,200.00	\$1,699,200.00

costs absorbed by KMN-L or through other sources of funding obtained by KMN

costs absorbed by KMN-L or through other sources of funding obtained by KMN

costs absorbed by KMN-L or through other sources of funding obtained by KMN

costs absorbed by KMN-L or through other sources of funding obtained by KMN

Instructor Training or Professional Development

Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total
5	Admin/Management/Financial		\$6,000.00	KMN	\$30,000.00		\$30,000.00
5	Te(a)ch facilitation training		\$5,000.00	Pinnguaq		\$25,000.00	\$25,000.00
5	ASIST Training		\$5,000.00	Embrace Life Council	\$25,000.00		\$25,000.00
5	Trauma-informed practice Training		\$5,000.00	Embrace Life Council	\$25,000.00		\$25,000.00

in-kind from Pinnguaq

5	KMN Digital Network Setup & Training program		\$10,000.00	Pinnguaq	\$30,000.00	\$20,000.00	\$50,000.00	in-kind from Pinnguaq
Subtotal Instructor Training or Professional Development					\$110,000.00	\$45,000.00	\$155,000.00	
Other Costs								
Quantity	Component Description	Notes	Component Cost	Delivery Org	Infrastructure Canada funded Costs	Other Sources of Funding	Total	
Subtotal Other Costs					\$0.00	\$0.00	\$0.00	
Community Makerspace SUBTOTAL					\$1,519,000.00	\$4,670,200.00	\$6,189,200.00	
Project Budget TOTAL (FY 2023-2024)					\$2,148,600.00	\$4,729,200.00	\$6,877,800.00	
Project Budget Total Year to Date					\$10,000,000.00	\$12,371,600.00	\$22,371,600.00	

Appendix A: Makerspace Portfolio

Section 1: Workshops and Curricula



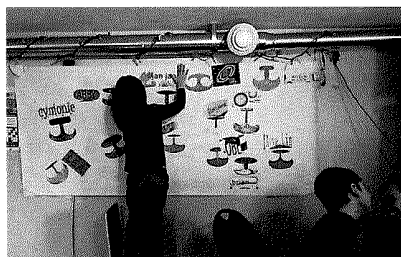
Reoccurring Programs

Tech Camps (Full Day)

Tech camps allow participants to explore technology in a fun way. These week-long camps engage students' imaginations with gaming, robotics, digital art, board games, and much more – all while encouraging critical thinking and technology literacy.

Previous Events

- February 18 to 22, 2019 • Tech Camp



Art Weeks (After School)

After-school art weeks give participants an opportunity to practice a variety of different techniques to create their own individually-inspired work. The supplies needed to complete projects are always provided. Every week is different. In the past, as an example, we've taught visual art fundamentals – covering watercolour and acrylic painting, pairing colours, line and pattern drawing, and much more. Our hope is that the Makerspace can continue to be a place where members from the community can gather and share their creativity with others.

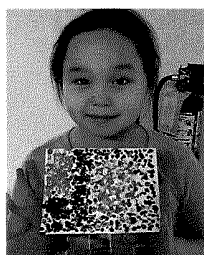
Section 1: Workshops and Curricula

Previous Events

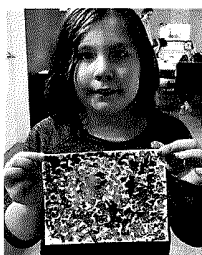
- October 9 to 12, 2018 • Visual Arts
- October 29 to November 2, 2018 • Sew 'n' Beads
- November 19 to 23, 2018 • Painting The North
- January 14 to 18, 2019 • Art Week



Painting Planets



Impressionist Painting



Sew 'n' Beads



Tech Weeks (After School)

After-school tech weeks give participants an opportunity to explore technology through a variety of methods. Computers, and any other software or tools required, are always provided. Like art weeks, every tech week is different. In the past, as an example, we've run a week on animation exploration – where participants learned to create flip books and animate a character, as well as animate themselves! Our key focus to encourage participants to consider how tech can be integrated into their lives and community.

Previous Events

- October 22 to 16, 2018 • Animation Exploration
- November 26 to 30, 2018 • VR, HTML, Memes
- January 7 to 11, 2019 • Tech Week
- February 4 to 8, 2019 • Tech Week



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Section 1: Workshops and Curricula

Hang Out Weeks (After School)

This is a week when kids can come for a less structured week of art and tech. That could mean many things; independent arts and craft activities, independent computer coding and creating, movies and popcorn, video games – or kids can just socialize and hang out with one another in a safe, friendly, supervised environment.

Previous Events

- January 21 to 25, 2019 • Hang Out



Saturday Classes for Adults

Periodically, art and tech classes are offered to adults ages 18 and over. We offer a safe, casual space for people to gather, learn some new skills, have a coffee and snack while being creative.

Previous Events

- November 17, 2018 • Still Life Watercolour Painting
- November 24, 2018 • Northern Landscape Collage

Saturday Classes for Children

Regular 8-week art and tech classes are offered to children ages 8 to 12 and teens ages 13 to 19.

Section 1: Workshops and Curricula

Single Programs

Iqaluit Makerspace Grand Opening

September 24, 2018



Robotics with Canada Learning Code

September 25, 2018



Coding with Canada Learning Code

September 26, 2018

Pixel Art and 2D Art

September 27, 2018

Tech Free For All

September 28, 2018

Katirnganiq Proposal - Government of Canada's Smart Cities Challenge

Section 1: Workshops and Curricula

Nunavummi Disabilities Makinnasuaqtiit Society: Learning Our Programs

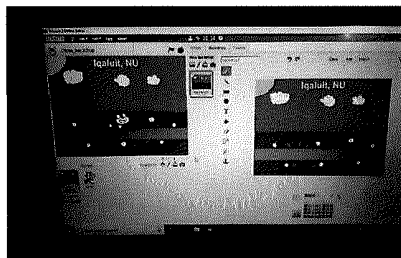
September 25 to 28, 2018

Pinnguaq facilitated a “train the trainer” workshop for the Nunavummi Disabilities Makinnasuaqtiit Society to train their staff on facilitating the te(a)ch program, as well as to bring computer programming lessons to their membership, including young offenders and at risk youth.

Code Club Global Contest

October 15 to 19, 2018

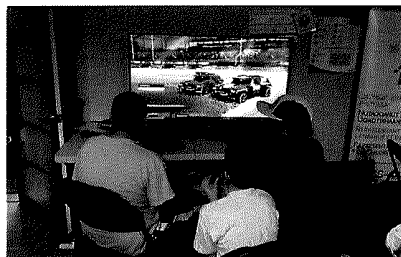
During this week, we participated in Code Club’s 2018 Global Competition. This competition encourages students to create projects that use code to tell a story about their community. Talia led by teaching the basics of Scratch and assisting students in creating their own projects.



Video Game Tournament

October 27, 2018

The Makerspace was used for a private video game tournament event. Participants played NHL 19, Rocket League, Mario Kart and Minecraft.



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Section 1: Workshops and Curricula

VR: Let's Build It! + VR: Check It Out!

November 8 to 10, 2018

Google at the Makerspace

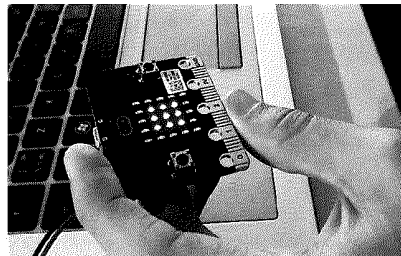
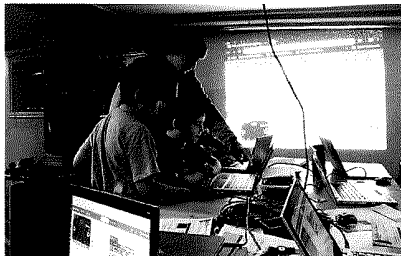
November 10, 2018



Micro:bit Global Challenge

November 12 to 16, 2018

During this week, we participated in the Global Goals Coding Challenge. Using micro:bits, Mac led our advanced young coders to solve real-world problems related to health and environment. This event was a partnership with Kids Code Jeunesse and the micro:bit Educational Foundation.



Hour of Code

December 3 to 5, 2019

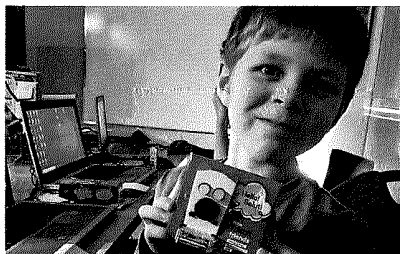
During this week, we introduced students to their first hour of computer science using Hour of Code activities. We used the Dance Party Coding lesson.

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Section 1: Workshops and Curricula

Canada Learning Code Dash and Scratch

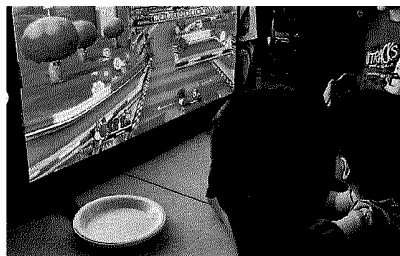
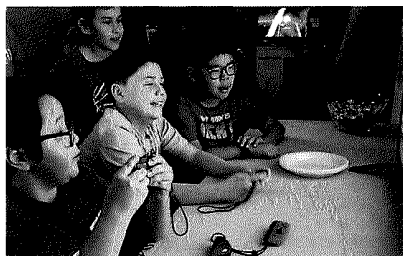
December 6 to 8, 2018



Smash Tournament

December 8, 2018

To celebrate the release of Super Smash Bros. Ultimate, we hosted a tournament party! Everyone was welcome to attend and lots of prizes were handed out.



Canada Learning Code: Envisioning Canada in VR

December 8, 2019

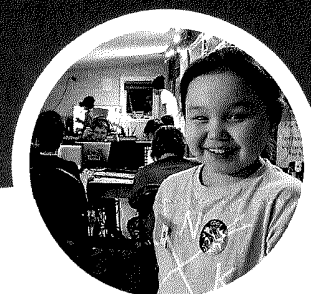
Led by Canada Learning Code, students learned about Anishinabe intermedia artist Scott Benesiinaabandan and his 2167 VR experience, then built their own WebVR project using A-Frame.

VR for Canada - Student Commission

January 25 to 26, 2019

Katinnaganq Proposal - Government of Canada's Smart Cities Challenge

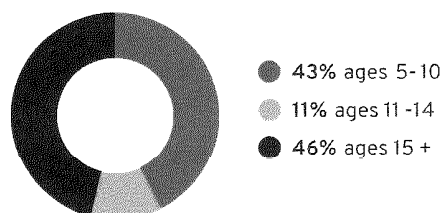
Section 2: Quantitative and Qualitative Data



Attendance Statistics

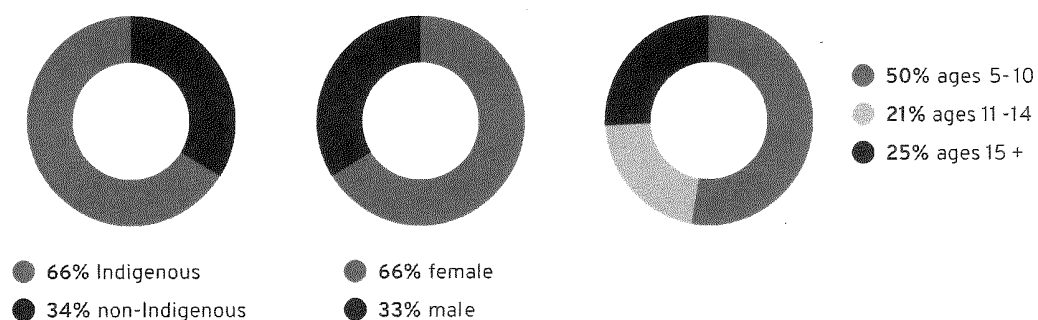
September 2018

141 Participants • 9 Events



October 2018

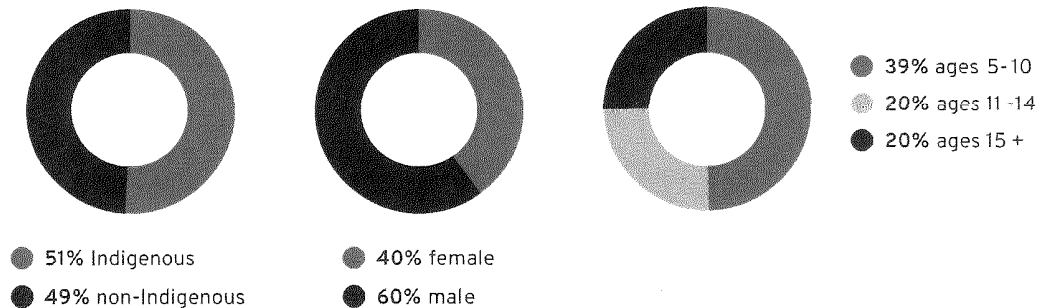
138 Participants • 18 Events



Section 2: Quantitative and Qualitative Data

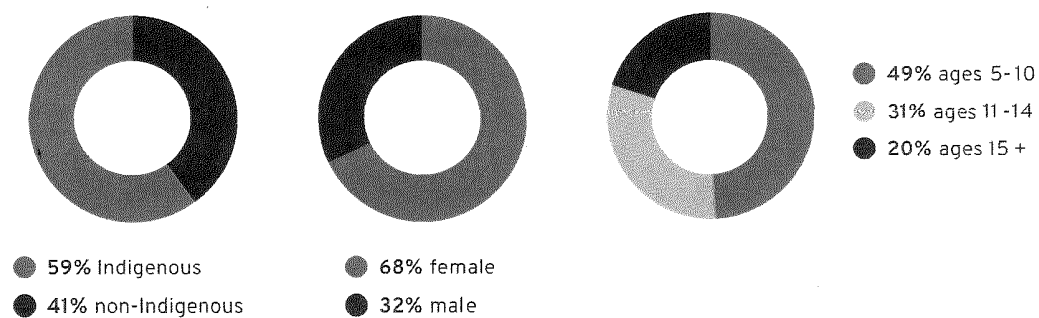
November 2018

199 Participants • 27 Events • 29 New Users



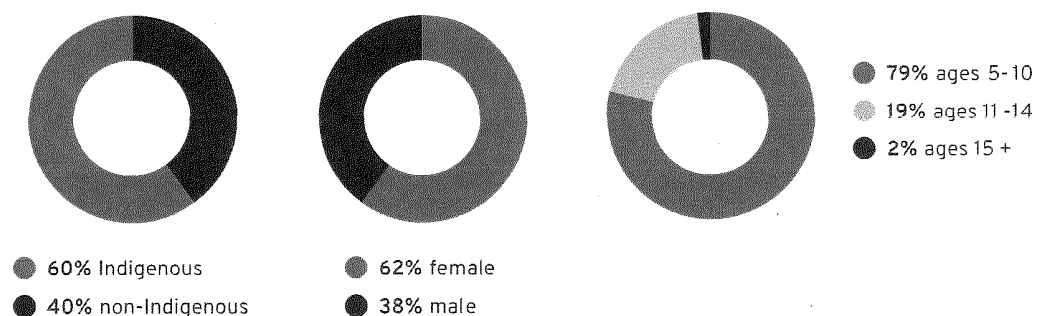
December 2018

111 Participants • 11 Events • 40 New Users



January 2019

133 Participants • 18 Events • 6 New Users



Kadinnaganig Proposal - Government of Canada's Smart Cities Challenge

Section 2: Quantitative and Qualitative Data

Tech Camp Feedback

Evaluation Answers

We asked four students who participated in the February 2019 Makerspace Tech Camp to answer the following questions.

What was your favourite part about the tech week?

• VR (2) • In/Outdoor Play • Scratch •

What do you want to learn more about?

• Video Games (2) • AR/VR • Art •

Overall, what did you think of tech week?



What did you think about your teachers?



At the Makerspace, I...

• met people and made new friends (3) • had fun (2) • learned something new (2) • made something (2) • loved it •

What did you like best about the Makerspace?

• All! (2) • Coding • No Answer

What else would you want to do at the Makerspace?

• Gaming • Exercise • None • Gym Stuff •

Appendix B: te(a)ch Curriculum List

Appendix B: te(a)ch Curriculum List

Game Design

1. **Introduction to Unreal Engine 4** - With full access to the complete source code and tools, this module is a great entry point to explore the 3D media fields (such as game development, movies, television, and prototyping). Students can use their creations to create scenes, levels, or even games.
2. **Building a House in Unreal 4 Part 2 of 3** - This module is designed to introduce Unreal Unreal Engine 4 Development kit as a creative tool. Specifically students will learn how to create a new project and explore the development environment.
3. **Introduction to Unreal Engine 4 – Part 3 of 3** - Students will take their blocked out house from the second part of the module, “Building a House in Unreal 4”, and polish it with provided assets.
4. **Introduction to Animation and Movement in Scratch** - The game we are going to make today is based on a book called “Trip to the moon”. The book was written by Vera Evic, an author from Pangnirtung, Nunavut, and was illustrated by various artists, including Elisapee Ishulutaq, Andrew Qappik, Jolly Atagoyuk, Peona Keyuakjuk, and Jessica Akapalialuk.
5. **Word Animation Beginner Scratch Module** - Students will learn the basics of programming and animation. They will explore the events, control and motion sections in Scratch to make a word animated.
6. **Creating an Animated Card in Scratch** - This module teaches some of the basics of animation and has students starting to explore the ‘Looks’ section on Scratch. Students will build on the basics of programming and animation by making and animating a virtual card. Students will work on their writing skills by creating a message that will display during their animation.
7. **Creating A Theme Song in Scratch** - Students will explore the sounds available in the Scratch library. They will play sounds from various instruments and put them together to make a theme song.
8. **Creating a Short Story Animation in Scratch** - Students will learn about myths, legends and folktales. Through the creation of a short folktale animation, students will improve their programming skills and knowledge of algorithms. They will use their language skills to have characters “speak” to each other and bring the folktale to life. Students will learn about Indigenous teachings and histories by choosing and researching an Indigenous story, myth or legend.
9. **Ice Hopping Conditional Statements** - In this module students will be exploring conditional statements and how they can be used in game design.
10. **Navigating Canada using Scratch** - By the end of this module students will be able to use cardinal directions in an xy-plane. They will understand Canadian geography, Indigenous cultural maps and basic programming skills.
11. **Goose Hunt in Scratch** - This module teaches how to create a goose hunting game. The goal of the game is to “hunt” as many geese as possible before the timer runs out, therefore the

instructions include how to keep score, how to set a timer, and how to make the goose appear randomly.

12. **Learning Procedural Writing with *Lightbot*** - Using the game *Lightbot*, students will learn how to create step-by-step instructions used in procedural writing. *Lightbot* is an introductory coding game that provides opportunities for students to understand how computers follow instructions.
13. **Paper Pathfinder** - In this module students construct an adventuring world (or labyrinth) using paper tiles that they create. Students will create and decorate their own creative tiles. These tiles will contain the required visual information that players need to navigate the “world” and complete the challenge(s) designed by the game-maker.
14. **Tenzi Dice Game Learning Random Numbers** - In this module students will learn about random numbers and how they are used in game design. Students will build a game in Scratch using the ‘random operator.’ After this module students will have the skills to create probability experiments.
15. **XY Hide and Seek Game** - In this module students will learn how to use x and y coordinates to place sprites on the workspace in Scratch. Using coordinates to locate or place items on Scratch can be transferred to graphing relationships and using coordinates on a map. This module also aligns with graphing positive and negative integers on a four quadrant grid.
16. **In Person Game: X/Y Grid- Memory** - The X and Y coordinates on a computer screen are used as reference points for objects and used frequently in the development of software and video games. It is how the placement of items on a screen are referenced so that the program knows where things are, and what is needed to manipulate the movement of items around a screen.
17. **Creating Your Own Board Game Using an Online Template** - This module teaches students basic computer skills through the creation of a board game using an online template. Students will become familiar with using Google to search for images, and uploading images to their board game.
18. **Introduction to User Experience (UX) and User Interface (UI)** - Students will learn the terminology of User Experience and User Interface, how they are different from each other and the places they intersect. They will look critically at a favourite application or game and dissect the UX and UI aspects, find areas that are done well and why, and areas that could be improved. In a second, alternative activity, students will work in groups to design their own mobile app elements based what they learn from user research.
19. **Introduction to wireframing with pencil** - Students will learn about wireframes: what they are and why they are important to the software development process. The module involves a hands-on tutorial featuring the open source wireframing program: Pencil. They will learn basics to navigate the program and create a small wireframe for a hypothetical mobile Task List application. Students will then be asked to consider alternative ways of building the wireframe and other functionality they could add using Pencil.
20. **An Introduction to Managing a Project** - Students will learn how to break big projects into more manageable “bite-sized” pieces that are easier to plan and work through. They will learn to look critically at tasks and ask questions to ensure they have all the information they need to move forward in an appropriate direction. The skills learned here apply to solo or group work and will

continue to be relevant as students move into higher education as well as in their own daily lives.

- 21. Introduction to Microsoft Small Basic** - This module is about understanding how to “talk” to the computer, to make the computer perform tasks and functions. The basics covered here form the basis of understanding any computer programming language, and the simplicity of Microsoft Small Basic is an ideal platform for teaching these concepts.
- 22. Mario Maker - Level Design** - In this lesson students examine the classic “World 1-1” level from Super Mario Bros. (1985), and how it teaches the player gameplay basics without using any text instruction. We will also learn the core elements of the Super Mario Maker program. By studying the Level 1-1 stage of Super Mario Bros. we can see the basics of excellent introductory level design.

Computer Fundamentals

- 23. Cultural Sensitivity when Posting Online** - Memes and funny videos are popular things to share online with friends. However, sometimes these memes or videos are offensive to some cultures and can hurt people. This module introduces students to the concept of critically evaluating what they are going to post or re-share, and gives them the tools to help them decide if something is culturally appropriate or not.
- 24. Digital Citizenship** - Being a digital citizen is more than just accessing and using the internet. Every time we post, share, like, research, stream a show, shop online, or play a connected game we are participating in the digital community. As “Digital Citizens” we need to know how to be safe, kind, and positive contributors to the communities we participate in.
- 25. Signal Processing** - In part one of this module, students will be introduced to the theoretical behaviours (of oscillation) needed to interpret patterns within the physical world as signals. At this level, the focus is on being able to read simple signals, and to understand that complex signals although imposing by appearance, can also be read.
- 26. Technology Consumption vs Creation** - This module aims to help youth understand that while technology is a great tool, it should not be consumed in excess. Using this taxonomy (Consume, Curate, Create) students will begin to develop the necessary skills to be critical users of technology.
- 27. Critical Literacy** - Students will learn how to find credible sources online and develop critical thinking skills. It is important to think about sources and assess whether they are reliable or not. The internet is full of information that is not always credible and is sometimes biased.
- 28. Properly Citing Sources** - The purpose of this module is to introduce students and adults to the concept of citing, and provide them with the proper resources and tools to cite correctly. It also encourages students to look at Indigenous cultural resources with a critical lens and to evaluate where the source is coming from. For example, is the author of an article trying to harm Indigenous peoples? Is their position that of an insider or outsider?

Online Safety

29. **Cyber-Bullying** - The purpose of this module is to teach students about cyberbullying: what it is, how to seek help if they are being cyberbullied, and how to recognize if their own actions—either intentionally or not—could be interpreted as cyberbullying. Indigenous communities are experiencing a suicide epidemic, and cyberbullying is a contributing factor in this crisis.
30. **Introduction to Social Media Safety** - In our society, most people use some form of social media every day. Though it can feel temporary and fleeting, things posted online continue to exist, and can have negative consequences for people later in life. This module gives a basic overview of privacy and security settings for Facebook, Twitter and Instagram, as well as tips for navigating social media in a responsible and safe way.
31. **Critical Literacy Finding Reliable Sources** - Students will learn how to find credible sources online and develop critical thinking skills. It is important to think about sources and assess whether they are reliable or not. The internet is full of information that is not always credible and is sometimes biased.
32. **Creating Strong Passwords** - Students will learn about how weak passwords can be discovered by thieves and how that compromises their personal information. Students will learn strategies to help create strong passwords when creating online accounts.
33. **Critical Literacy Module - Scams** - Students will build the required skills to avoid being subject to an online scam. There are many scams and being deceived is easy. Having critical literacy and online skills helps users recognize the characteristics of scams and cybercriminals, and ultimately avoid being scammed online.

Minecraft

34. **Introductory MineCraft** walk through Videos (also recorded in Inuktitut)
35. **Choosing a Mod in Minecraft** - This module is a guide for understanding and matching up mods in Minecraft. It teaches students how to make appropriate selections when choosing mods, and offers guidance for teachers wishing to create a learning environment with Minecraft.
36. **How To Install a Mod and Where to Start** - In this module students will learn how to install a single, well-known mod in to Minecraft, up to advanced multiple mods. This opens up the Minecraft world to many more opportunities and potential for an extensive game. Learning how to use mods for Minecraft is an asset to coding, and builds advanced computer skills, such as working with libraries, files, and data.
37. **Creating an Adventure Map in Minecraft** - In this module, students will design and create an adventure map in Minecraft that can be shared with others. This is a great way to share a story through Minecraft, create a world for others to explore, and for users to be creative within a game.
38. **Creating Custom Skins for Minecraft Characters** - Minecraft can be a great creative tool. It allows you to explore, create and play the game the way one chooses. However, one of the most rewarding ways of interacting with Minecraft is by creating custom skins for the game characters and other assets.

- 39. Troubleshooting Mods** - In this module students will learn how to fix basic problems that are commonly found when putting together multiple mods. Common issues will be covered, followed by a brief activity, then further instructions on building a modpack.
- 40. Learning with Mods:** This module provides guidance for teachers interested in teaching with Minecraft, and looks at how popular mods can be used.

Art Design

- 41. Introduction to Pixel Art:** 2D graphics form the basis of most software applications, both in gaming and non-gaming programs. In this module students will create a pixel art sprite with physical media and then transfer that image into a freeware program called GIMP to make a useable PNG image file.
- 42. Pixel Art 02: Core Techniques in GraphicsGale:** Pixel art can be a versatile tool in creating 2D graphics for games and software. There are a handful of techniques that can get around some of the limitations of the medium and help your artwork look more professional. This module expands on the basics of Pixel Art 01, teaching further techniques and terminology, and highlighting some common problems, using the open source software GraphicsGale.
- 43. Pixel Art 03a: Tiling Basics- Tilesets,** a collection of the tiles within a program, allow developers to create expansive in-game areas with a minimum of visual assets by essentially copying and pasting from the available tiles. Seamless tiling, made by matching up opposing edges of tile, allow a developer to cover large areas in similar tiles and disguise the fact that tiles are being placed and reused in a predictable grid-like pattern. In this module students will learn the basics of tile creation using the pixel art skills acquired in modules 1 and 2.
- 44. Pixel Art 03b: Advanced Tiles** - Students will learn about the function of tiles within a game and how to create their own. Building on techniques acquired in previous modules they will build important game framework tiles. Students will also learn how to work with layers and transparency within the image creation software *GraphicsGale*.
- 45. Pixel Art 03c: Tile Permutations** - Students will learn about the function of tiles within a game and how to create their own. Building on techniques acquired in previous modules they will build important game framework tiles. Students will also learn how to work with layers and transparency within the image creation software *GraphicsGale*.
- 46. Pixel Art 04a: Animation Basics in GraphicsGale** - The techniques introduced in this module can help improve the quality of a student's final pixel art graphics. Students will gain a better understanding of using image editing software to create graphics as well as common mistakes to avoid.
- 47. Pixel Art 04b: Animation Basics in GraphicsGale - Scrolling and Layers** - Students can use the techniques introduced in this module to improve the quality of their pixel art graphics. They will gain a better understanding of how to use image editing software to create animated graphics and use layers to enhance depth.
- 48. Creating Voxel Art with MagicaVoxel** - In this module students will learn how to create three-dimensional pixel art with MagicaVoxel.

- 49. Introduction to 3D Modeling** - Students will be introduced to 3D modeling using Blender. Students will be encouraged to take these skills and model their own ideas. At the end of the module students should be able to render out an Innuksuk that they have created.
- 50. Creating Traditional Métis Dot Art** - "Dot Art" uses dots of paint to mimic these traditional beading styles. Students will learn about Métis people through an exploration of Dot Art, and how to create pixel art for video games.
- 51. Creating Art in Inkscape** - In this introductory module students will learn the basic tools of Inkscape so they can create their own unique vector art
- 52. Pixel Art-Doing Beadwork Designs** - The goal of this module is for students to be introduced to the concept of beading, and learn about the history of beading in Indigenous culture. Then students will use a digital resource (Pixel art) to map out their different beadwork designs and then replicate their digital designs with beads.
- 53. Image Manipulation in GIMP** - Students will learn how to manipulate images using GIMP (GNU Image Manipulation Program), including cropping and resizing images, adding text, and using layers.
- 54. Photo Retouching in GIMP** - Students will learn how to retouch photos using GIMP. Specifically they will learn ways to fix old and damaged photos, remove "red eyes" and touch up skin imperfections. They will also explore the importance of images in history and how they can help us infer information about the past.
- 55. Introduction to SketchUp for 3D House Modeling** - Students will learn how to model a 3D house in *SketchUp*. 3D modeling is a talent that requires continuous learning as each modeling software has its own unique interface. *SketchUp* is easier to learn than software such as *Blender*, but can be used for a multitude of things.
- 56. Introduction to Graphic Design** - In this module students are introduced to basic terminology and principles of graphic design. Topics include colour combinations using the colour wheel, balance, alignment, and focus. The module involves critical thinking and examination about their personal design preferences, as they relate to graphic design topics. Students will apply their understanding of the topics presented through the creation of a brief and creative design project.

Digital Storytelling

- 57. Joke Telling Using Scratch** - Students will be learning how to tell jokes using the resources available on Scratch. They will be exploring their sense of humor and sharing their jokes with their peers. Students will have the opportunity to add to their jokes by choosing appropriate sprites and animating them.
- 58. Comic Book Storytelling (Using Seven Grandfather Teachings)** - The Seven Grandfather Teachings are culturally significant and guide many beliefs and practices of the Anishinaabe people. Art and creativity is very prominent in Indigenous communities and many artists draw pictures of these grandfather teachings in various forms and ways. This module will introduce the Seven Grandfather Teachings by using digital comic book strips.

59. **Introduction to TWINE** - By the end of the module, the student will have a working prototype made with Twine. This is a great start for any students who want to learn to code or make games.
60. **Exploring Biological Systems Using TWINE** - Through creating a story in Twine, students will learn about the systems in the human body and how they interact with each other. The story they create will branch off in different directions, just as systems in the body take many paths. Students will be developing their programming knowledge while discovering more about the human body systems.
61. **Math Storytelling using TWINE** - Students will use their knowledge of probability and data management to create math questions within a children's story. Twine is the ideal program for this, as students can add the questions within their story and use the answer to move to the next passage. Images can be added to visually enhance the story.
62. **Exploring Chemical Reactions using TWINE** - For this module students will explore different types of chemical reactions. The teacher can decide if students will cover a specific type of reaction or if they should cover all types. Students will include videos of reactions and a description of the reaction.
63. **Mythology using TWINE** - Students will learn about various myths, legends and folktales while programming a Choose Your Own Adventure style story in Twine. The purposes behind the cultural myths will be examined and incorporated into student's stories.
64. **Planning an Escape Room using TWINE** - For this module students will plan an escape room or code-breaking story in Twine. The theme of the story can be determined by the teacher to tie into curriculum.
65. **Using TWINE For a Novel Extension Activity** - For this module students will create an interactive story using a novel they have read. There are a few options for this extension activity including creating an alternative ending, telling the story from another character's point of view or re-writing elements of the story (for example having the main character make a different choice.) Students will have to think critically about how these changes affect the story and how it will make it different.
66. **Creating a Word Monster using TWINE** - For this module students will create a Word Monster game in Twine using if statements, links and variables. They will explore the different functions in Twine and various ways they can be used. This module is for students who have completed the *Introduction to Twine* module or for those with a working knowledge of Twine.
67. **Using Twine to explore Environmental Preservation** - Students will learn about the impact of climate change on the environment and explore other environmental concerns. They will be writing an interactive story that involves the choices we make and their impact on the environment.
68. **Storyboards** - Because video games are a visual medium, storyboards are a great way to map out the story being told through the video game. In this module students will have an opportunity to look at storyboards and consider the visual cues that can help tell a story.
69. **Understanding the Importance of Oral Stories** - The purpose of this training module is to provide a learning tool that Pinnguaq facilitators, teachers and parents can use to teach youth about oral stories in Indigenous culture. As stories differ between Indigenous nations,

facilitators should identify which stories would have the most regional relevance to achieve the greatest impact.

- 70. Infographics** - By the end of this module students will be comfortable creating infographics using Piktochart. They will be able to think about their intended audience, and identify what key points are most relevant to that demographic.

Sound Design

- 71. Introduction to Audacity** - *Audacity* is a free program that allows you to record and edit audio. *Audacity* can be used to record songs, audiobooks, podcasts, and lessons. Oral Communication is an important aspect of Indigenous tradition and culture. Bringing *Audacity* into the community can provide new opportunities to preserve and document communications.
- 72. Copyright of Music and Imagery** - Students will learn what copyright is and how it relates to gaming. They will learn key concepts such as trademarks, patents, the public domain, fair use, intellectual property and infringement. A thorough understanding and awareness of copyright will help students avoid infringing on someone else's work (music, imagery, words, and titles).

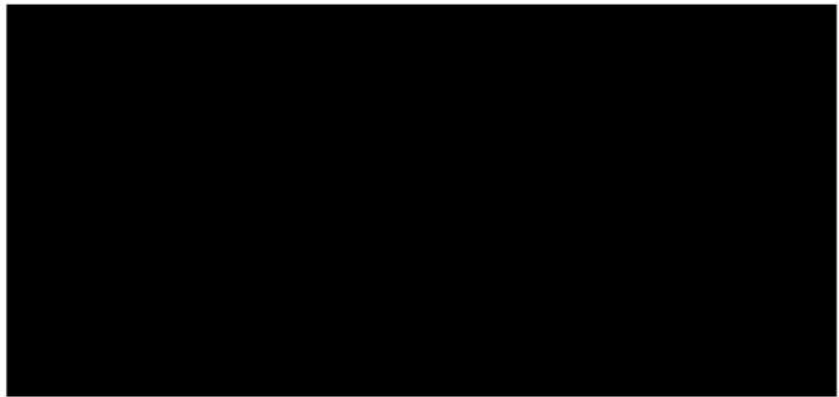
App Development

- 73. Introduction to App Lab** - Students will learn what is involved in developing an app, and the basics of app programming using App Lab on code.org. They will add different elements to their app and learn how to change and customize their properties.
- 74. Creating a Personality Quiz with App Lab** - In this module students will create a personality quiz in App Lab. Students will be learning how to use an *if else loop* and make a *variable*. They will plan their quiz, reason through possible outcomes, and think of ways to make the quiz fun for users.

AR/VR

- 75. Augmenting an image using HP Reveal** - This lesson introduces augmented reality creation at a basic level. The step by step instructions direct the student on how to create an "Aura" using a picture as a "Trigger".


Appendix C: Letters of Support



February 22nd 2019

Mr. Brian Fleming
Executive Director
Nunavut Association of Municipalities (NAM) and the
Nunavut Association of Municipal Administrators (NAMA)
Building 630, Qamutiq Building, Iqaluit, NU.
P.O. Box 4003, Iqaluit, NU
X0A 1H0

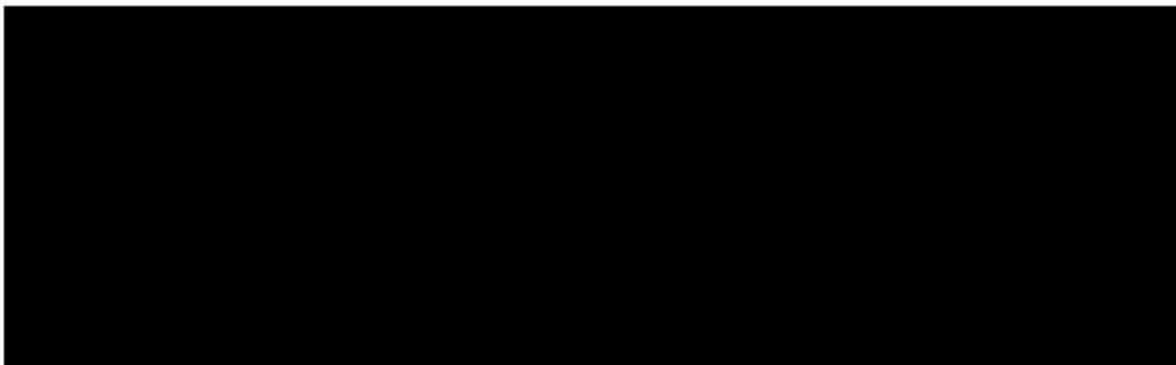
Dear Mr. Fleming,

 would like to express its support for the Nunavut Association of Municipalities' final application, titled Katinnganiq: Community, Connectivity, and Digital Access for Life Promotion in Nunavut - for Infrastructure Canada's Smart Cities Challenge.

We look forward to developing a plan to implement this initiative in our community in order to increase preventative and protective factors to promote life and support pathways to mental wellness.

Yours truly,






Letter of Support

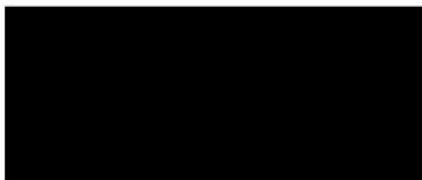
February 19, 2019

Dear Smart Cities Challenge Jury,

 would like to express its support for the Nunavut Association of Municipalities' final application, titled Katinnganiq: Community, Connectivity, and Digital Access for Life Promotion in Nunavut – for Infrastructure Canada's Smart Cities Challenge.

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Yours, truly





January 29, 2019

Dear Smart Cities Challenge Jury,

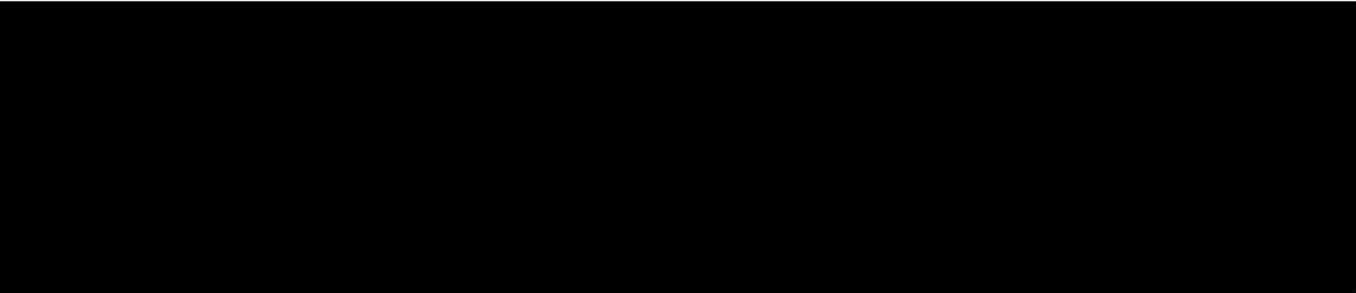
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We look forward to developing a plan to implement this initiative in our community in order to increase preventative and protective factors to promote life and support pathways to mental wellness.

Thank you.


Sincerely, 

A large black rectangular box redacting the signature and any accompanying text or title.



February 15th, 2019

Dear Smart Cities Challenge Jury,



_____ would like to express its support for the Nunavut Association of Municipalities' final application, titled Katinnganiq: Community, Connectivity, and Digital Access for Life Promotion in Nunavut - for Infrastructure Canada's Smart Cities Challenge.

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Thank you,

Sincerely,



ATIA - 13(1)(d)

ATIA - 19(1)



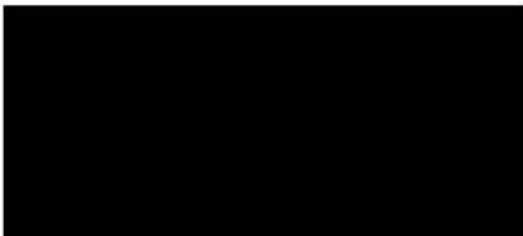
Dear Smart Cities Challenge Jury,

[REDACTED] would like to express its support for the Nunavut Association of Municipalities' final application, titled Katinnganiq: Community, Connectivity, and Digital Access for Life Promotion in Nunavut - for Infrastructure Canada's Smart Cities Challenge.

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Thank you,

Sincerely,





February 15, 2019

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Sincerely



[REDACTED]

[REDACTED]

February 8, 2019

Dear Smart Cities Challenge Jury,

[REDACTED] would like to express its support for the Nunavut Association of Municipalities' final application, titled Katinnganiq: Community, Connectivity and Digital Access for Life Promotion in Nunavut for Infrastructure Canada's Smart Cities Challenge.

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Thank you,

Sincerely:

[REDACTED]

ATIA - 13(1)(d)

ATIA - 19(1)

February 15, 2019

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Thank you,

[REDACTED]

ATIA - 13(1)(d)

ATIA - 19(1)

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Thank you,

Sincerely,

[REDACTED]

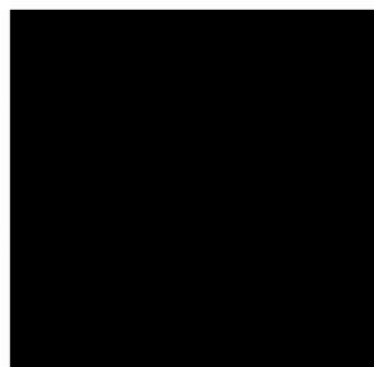
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Thank you,

Sincerely,



ATIA - 13(1)(d)

ATIA - 19(1)

January 30, 2019

Dear Smart Cities Challenge Jury,

[REDACTED] would like to express its support for the Nunavut Association of Municipalities' final application, titled Katinnganiq: Community, Connectivity, and Digital Access for Life Promotion in Nunavut - for Infrastructure Canada's Smart Cities Challenge.

We look forward to developing a plan to implement this initiative in our community in order to increase preventative and protective factors to promote life and support pathways to mental wellness.

Thank you

[REDACTED]

[REDACTED]

ATIA - 13(1)(d)

ATIA - 19(1)



February 14th -2019


Brian Flemming
Exectutive Director
Nunavut Assoc. of Municipalities(NAM)
Nunavut Assoc. of Municipal Administrators

Dear Mr. Flemming

[REDACTED] fully supports the NAM proposal on behalf of Nunavut Municipalities to submit and coordinate using mobile data connectivity and Apps written in Inuktitut for suicide reduction in Nunavut. If the proposal is approved in the first round we look forward to futher consideration.

Sincerely [REDACTED]






ATIA - 13(1)(d)

ATIA - 19(1)

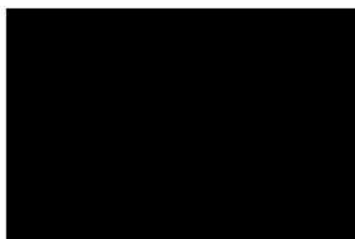
February 21, 2019


Dear Smart Cities Challenge Jury,

 would like to express its support for the Nunavut Association of Municipalities' final application, titled Katinnganiq: Community, Connectivity, and Digital Access for Life Promotion in Nunavut - for Infrastructure Canada's Smart Cities Challenge.

We look forward to developing a plan to implement this initiative in our community in order to increase preventative and protective factors to promote life and support pathways to mental wellness.

Thank you,





ATIA - 13(1)(d)

ATIA - 19(1)

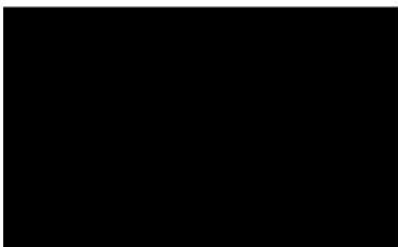
February 7, 2019

Dear Smart Cities Challenge Jury,

 would like to express its support for the **Nunavut Association of Municipalities' final application, titled Katinnganiq: Community, Connectivity, and Digital Access for Life Promotion in Nunavut - for Infrastructure Canada's Smart Cities Challenge.**

We look forward to developing a plan to implement this initiative in our community in order to increase preventative and protective factors to promote life and support pathways to mental wellness.

Thank you,



[REDACTED]

Brian Fleming
Executive Director
Nunavut Association of Municipalities

March 5, 2019

Re: Smart Cities Challenge, Infrastructure Canada

Dear Brian,

I [REDACTED] provide this letter of support for Nunavut Association of Municipalities' final application, Katinnganiq: Community, Connectivity, and Digital Access for Life Promotion in Nunavut. I recognize this is a collaborative project developed in partnership with Pinnguaq Association, Embrace Life Council, and Qaujigiartiit Health Research, as part of Infrastructure Canada's Smart Cities Challenge.

[REDACTED]

[REDACTED] supports the initiative's overarching goals of increasing preventative and protective factors to promote life and support pathways to mental wellness in our communities through nurturing learning environments that address access to digital literacy and tools for innovation. The stated goals of the Katinnganiq proposal - to improve youth health and wellness by teaching new skills; fostering positive peer and adult relationships; connecting with culture and identity; and providing new creative outlets - align well with the goals of [REDACTED]

Projects like this that aim to build digital and STEAM-based education, critical thinking, experimentation, and knowledge-sharing while at the same time amplifying Inuit Qaujimajatuqangit principles such as collaboration, creativity, and problem-solving, while foregrounding relationships to the land, environment, and culture can help build important capacity and infrastructure in Nunavut.

[REDACTED] is supportive of projects focused on knowledge building and sharing. We wish this project success and look forward to hearing more about it as it moves forward.

Respectfully [REDACTED]

[REDACTED]

ATIA - 13(1)(d)

ATIA - 19(1)




Brian Fleming
Executive Director, Nunavut Association of Municipalities PO
Box 4003
Iqaluit, NU X0A 1H0

March 4th, 2019

Dear Mr. Fleming:

The Katinnganiq Makerspace Network represents an empowering vision for Nunavummiut. Providing safe, neutral spaces to create, learn, to be yourself and come together with peers will give a home for cooperation and possibility, something sorely lacking in Nunavut. Although the impact will be immediate, especially for young people, I have no doubt that these spaces, and the network connecting them, will soon be considered essential infrastructure for community building and innovative local problem-solving.




Ensuring a safe, inclusive space that promotes age, gender and cultural diversity was a huge problem of makerspaces, and Pinnguaq has done an incredible job making sure that the Iqaluit makerspace sets a new standard in this respect.



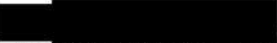
Sincerely,





February 12th, 2019


Dear Smart Cities Challenge Jury,

 would like to express its support for the Nunavut Association of Municipalities' final application, titled Katinnganiq: Community, Connectivity, and Digital Access for Life Promotion in Nunavut - for Infrastructure Canada's Smart Cities Challenge.

We look forward to developing a plan to implement this initiative in our community in order to increase preventative and protective factors to promote life and support pathways to mental wellness.

Thank you,

Sincerely,



**Page 562
is withheld
pursuant to paragraph
13(1)(d)
of the *Access to Information Act***

**La page 562
Font l'objet d'une exception totale
conformément aux dispositions de paragraphe
13(1)(d)
de la *loi sur l'accès à l'information***

**Page 563
is withheld
pursuant to paragraph
13(1)(d) and 19(1)
of the *Access to Information Act***

**La page 563
Font l'objet d'une exception totale
conformément aux dispositions de paragraphe
13(1)(d) et 19(1)
de la *loi sur l'accès à l'information***

From: Long, Alexander (INFC)
Sent: April 11, 2019 3:32 PM
To: Jacaban2, Evalynne (INFC)
Subject: FW: Smart Cities Challenge - Nunavut Assoc. of Municipalities
Attachments: image001.wmz; Letter to Jenny Tremblay.pdf

From: ATIPP Office - NU [mailto:admin@atipp-nu.ca]
Sent: March 19, 2019 1:51 PM
To: Tremblay, Jenny (INFC) <jenny.tremblay@canada.ca>
Cc: [REDACTED]
Subject: Smart Cities Challenge - Nunavut Assoc. of Municipalities

Good morning Jenny,

Attached please find a scanned copy of correspondence from the Information and Privacy Commissioner of Nunavut. Original to follow via Canada Post.

Regards

Lee

Mársi | Kinanāskomitin | Thank you | Merci | Hǎj' | Quana | Qujannamiik | Quyanainni | Máhsi | Máhsi | Mahsi

Lee Phypers

Lisa (Lee) Phypers
Office Manager | Gestionnaire de bureau
The Independent Statutory Offices | Bureaux des titulaires de charges publiques indépendants

Nunavut - Office of the Information & Privacy Commissioner
Nunavut - Bureau du commissariat à l'information et à la protection de la vie privée



PO Box 382 | C. P. 382
Yellowknife, NT X1A 2N3

Tel | Tél. : 867-669-0976
Toll free | Sans frais : 1-888-521-7088
Fax | Téléc. : 867-920-2511
Email | Courriel : admin@atipp-nu.ca

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interdit de le copier ou de le distribuer. Si vous avez reçu ce message par erreur, nous vous demandons de bien vouloir le supprimer immédiatement et de nous en informer par téléphone. Merci.



P.O. Box 382
Yellowknife, NT
X1A 2N3

March 19, 2019

Infrastructure Canada
180 Kent Street, Suite 1100
Ottawa, ON
K1P 0B6

VIA email

Attention: Jenny Tremblay
Director General, Smart Cities Challenge Directorate

Dear Ms. Tremblay

RE: Smart Cities Challenge
Nunavut Association of Municipalities

I am pleased to report that I connected with the Nunavut Association of Municipalities to review with them, in a broad way, the aspects of their Smart Cities Challenge submission which may involve the collection, use or disclosure of personal information. They did complete a preliminary privacy impact assessment but unfortunately it was completed late in the game and there was little time for my office to do a thorough review of it. I was, however, able to give them some very high level feedback and suggestions for going forward. I am looking forward to working with them to address gaps and concerns identified in the PPIA should they be the successful proponents in their category. It should be noted that, in many respects, it was difficult for this group to address the specific legislative requirements applicable to them as the Nunavut *Access to Information and Protection of Privacy Act* does not yet apply to municipalities and it is questionable, at best, whether PIPEDA would apply. I encouraged them to proceed on the basis that PIPEDA did apply in order to ensure that, regardless of existing legislation, they would be compliant with privacy best practices.

Yours truly

Elaine Keenan Bengts
Information and Privacy Commissioner
/kb

Encl.

c.c. [REDACTED] NU Assoc. of Municipalities

- **Katinnganiq: Community, Connectivity, and Digital Access for Life Promotion in Nunavut**

1.) Description of the Initiative: Provide a summary of the program, project activity or system, describe its purposes, goals and objectives. Explain the need for the new program, project or system and its benefits.

The Katinnganiq: Community, Connectivity, and Digital Access for Life Promotion in Nunavut is a proposal being submitted to the Smart Cities Challenge competition by the Nunavut Association of Municipalities (in collaboration with Pinnguaq Association, Embrace Life Council, and Qaujigiartiit Health Research Centre) on behalf of the 25 municipalities of Nunavut. The goal of the proposal is to implement protective and preventative measures to reduce the risk of suicide in Nunavut, which is ten times the national average, and increase the amount and accessibility of peer support networks, educational resources and creative outlets that promote positive Mental Health to all Nunavummiut.

Our goal to promote life and positive mental health for young Nunavummiut is sought by increasing protective factors and contributing to social equity through community makerspaces that nurture wellbeing while addressing the digital divide in the North. As articulated in our challenge statement, we seek to increase the availability and accessibility of life promoting activities, resources and support systems like peer networks, educational initiatives and creative outlets to all Nunavummiut in the expanded field of data and technology.

The purpose of the Makerspaces initiative is to build youth resilience to embrace the future with confidence, armed with new coping skills and tools, and supported by positive relationships. The central focus of Makerspaces is on 'protective factors', where youth will build a personal sense of belonging, meaning, purpose and hope through their participation in activities. This initiative will provide safe, nurturing, welcoming social hubs for Nunavummiut that:

- **Provide imaginative and engaging programs:** including recreational, extra-curricular learning and skills acquisition (leadership, technology, interpersonal), the arts (performance, visual, music), traditional cultural/ language activities, peer mentoring, Elder mentoring, and coaching.
- **Leverage digital connectivity** where youth have opportunities to connect within communities and across Nunavut's 25 hamlets, share knowledge with each other and express themselves through access to digital tools and technological know-how utilizing new telecommunications technology. Specifically, this concerns development of a digital platform for the Katinnganiq Makerspace Network (KMN) to support social connections and supportive peer networks
- **Integrate community support**, including wellness services, where youth can access social/community services delivered on a 'whole person' basis in Makerspaces. We expect each Makerspace to be a connection to local mental health resources through staff trained in ASIST (Applied Suicide Intervention Skills Training) and Trauma informed practice - as well as a direct connection to other resources offered by the Embrace Life Council and local counselling services.

2) Scope of this PIA: Explain what part or phase of the initiative the PIA covers and what it does not cover.

This is a preliminary PIA that outlines where we see potential privacy implications and how we will address them throughout this initiative. Feedback from the Privacy Commissioner of Nunavut will be sought and considered. If selected as winners, we will continue to work with the office of the Privacy Commissioner of Nunavut to develop a fully fleshed out PIA.

3) Elements of Information or Data: List the personal information data elements involved in the initiative. This could include citizen's name, age, address, educational history, work status, health information, financial information, photos, comments on a blog, license numbers or hiring data.

- Name
- Age
- E-mail address (and other contact information like telephone numbers)
- Name of parent or guardian
- Phone number of parent or guardian
- Food allergy information (Allergies? Anaphylactic? Symptoms, Warning signs)
- Network username
- Individuals own art/work
- User-generated data on a closed online forum (text-based messages, photos, code, art projects)
- Opinions and thoughts given through consultation and evaluation efforts (includes surveys, one-on-one interviews, sharing circles, journaling, voice recordings, videos, participants observation, descriptive reports), as well as personal demographic information such as age, race, gender and ethnicity) that relate to the KPI's outlined in chapter 3: performance measurement.

4) Description of Information Flow (include text and diagram): Attach an information flow diagram showing how information will be collected and disclosed as a result of the initiative.

The collection, use, and disclosure of personal information for this initiative will be contained to four main areas and will be sought, as much as possible, through written and informed consent. The four main areas are:

- Makerspace Registration:

To participate in a makerspace, an individual will be requested to register by providing personal information (their name and age) to sign a liability waiver and allergy form. Individuals will be asked to read the code of conduct and waiver form for use of the space – and provide their name, age, and signature, (or if a minor, the name and signature of their parent or guardian). Since a makerspace may on occasion serve snacks and food, Individuals or their parents/guardians will also be asked to fill out an allergy form, disclosing any known food allergies and instructions to inform staff on emergency procedures and emergency contact information. This information will be stored in hard-copies at the location, and kept on file for 12 months after the individuals last attendance. The allergy form may be updated at any given time by an individual or their parent or

guardian (if they are a minor).

- Katinnganiq Makerspace Network Digital Platform:

When in the makerspace, an individual will be able to access and use makerspace computers, software, e-learning content, hard-drive storage space (not cloud) and a user forum through a Single-Sign-On security platform – which will require an individual to create an account with a username and password associated to an email address. Individuals may also access the network through a temporary/single use username and password.

On the user forum, individuals may generate and share personal information (in the form of messages, photos, ideas, opinions, for example) with others on the same network. Individuals will have the right to delete this information at any point in time.

- ASIST Certified Staff and Trauma Informed Practice

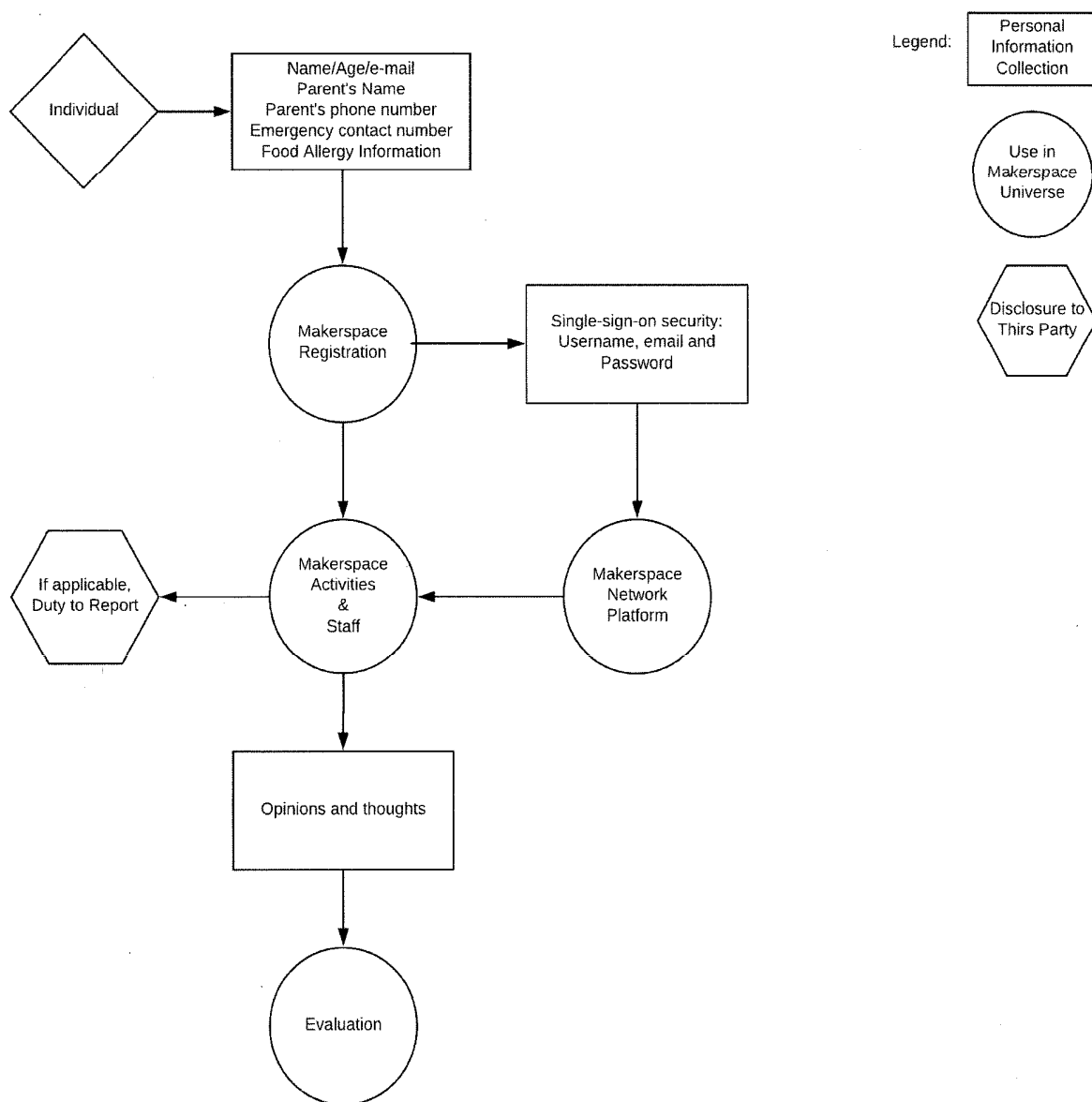
At the makerspace, staff will be trained in ASIST (Applied Suicide Intervention Skills Training), and Trauma-informed practice, coordinated by the Embrace Life Council. ASIST is a best practice training developed by LivingWorks which provides people with skills to help prevent the immediate risk of suicide. Trauma Informed Practice is a half-day training designed to increase individual success and well-being in Nunavut. It helps participants understand how to better support individuals who have experienced trauma, whether first-hand, historically, or intergenerationally.

An ASIST certified staff person will act in accordance with their training and continuously disclose that they are ASIST Certified (The makerspace will have ASIST stickers displayed to indicate that one or more staff are ASIST certified). ASIST trained staff will have the capacity to provide guidance and first aid to a person at risk in ways that meet their individual safety and privacy needs. In other words, Staff be trained to spot risky behaviors and mental health experts will be asked to intervene. In no way will Makerspaces staff attempt to provide professional/clinical care.

A staff person will act on their duty to report a child needing protection only to report any indications of immediate risk of self-harm, or suspected cases of child abuse or neglect, as required by the Nunavut's Child and Family Services Act.

- Evaluation:

When conducting evaluation for Makerspaces, individuals will be asked for their written and informed consent to provide, use and disclose their opinions in relation to the KPI's outlined in Chapter 3: Performance Measurement regarding the makerspace and its programs. Anonymous demographic information such as age, race, gender and ethnicity will also be collected if voluntarily provided. Individuals will be asked for this information mostly through surveys, as well as through one on one conversations, sharing circles, interviews. They may choose not to provide any information. If they do, the information they provide will be collected anonymously and with care to be non-identifiable, and will be used for evaluation purposes only, such as informing decision-making and improving programs. Evaluation data will be published in public reports.



C. Collection, Use and Disclosure of Personal Information

- 5) **Limiting Collection, Use and Disclosure:** Privacy is a fundamental right of citizens and so any limitation on the privacy of citizens should be carefully analyzed to ensure such limitation is warranted. If your project involves highly sensitive personal information, a broad collection of personal information or a serious impingement on privacy⁴ answer the following four questions before proceeding:

- Makerspace Registration:

The collection of the personal information identified for registration and participation in makerspace activities is necessary for makerspace staff and instructors to know who, and how old the participants are; to make sure that they have parental or guardian authorization to be there; to know that each individual (and/or their parent/guardian) has read and agreed to the code of conduct and signed the liability form; and because a makerspace might on occasion serve snacks and food, there is a need for staff to be able to take necessary precautions in the event of a food allergy, and have an appropriate emergency action plan and contact information should an allergy/medical emergency occur.

This information will be limited in use - accessed only by Makerspace staff, and not to be disclosed to any third party. We believe that having this information will support makerspace staff to adjust language and activities to suit participants varying age range, and to be able to communicate with them and with parents about programs being offered, schedules, and other related notices. In the case of food allergies, having the knowledge of what foods to avoid as well as what protocols to follow can be life-saving in case of emergencies. The information we collect will be the minimal to provide effective services – though at the moment no less privacy invasive methods have been tried.

- KMN Digital Platform:

Because each makerspace will have a series of shared computers available to the public, it will be necessary to protect user's personal information that is generated through their use. For that reason, we will request each user to set up an account to access the software, resources and user forum that will be available. The account set-up will request an email address, a username, and a password for a single-sign-on (SSO) authentication (like Kerberos) to the KMN Digital Platform – which enables each user to access the platform in a secure and private way – allowing for one's personal use of the resources while providing a storage space for individual work. The SSO use of an email address/username and password will reduce the amount of sign-in's to individual products, therefore reducing the amount of personal information collected as well as the security threat to that information. Therefore, the SSO provides the most amount of security combined with a minimum requirement of personal information. A user account will be deleted after 12 months of inactivity. Storage for each account and computer will be synchronized through a Network Attached Storage Solution (NAS) – which is a system that connects a storage device to a network, allowing storage retrieval of data from a centralized location for authorized network users. Files saved in the local Lab and network attached server will be encrypted while synchronized through cloud services through a RAID management system like Synology.

- ASIST Certified Staff and Trauma Informed Practice

One of the goals of this initiative is to provide a space where users can connect to culturally safe wellness resources. The Trauma-informed practice training, along with the ASIST Training delivered by the Embrace Life Council are important resources for front-line workers to better support Inuit youth. With this training Makerspace staff will have the skills, not to provide counselling, but to provide

guidance and mental health first aid to a person at risk in ways that meet their individual safety needs. This measure presents itself as an effective way that feeds into the overall role of Makerspaces in promoting life and improving pathways to mental wellness by connecting to culturally safe wellness resources. There will be no collection and use of personal information recorded by the Makerspace – with conversations occurring only between individuals at a personal level. The only instance in which personal information will be disclosed, is through mutual agreement between Staff and individual as part of a safety plan – or when a staff person sees the need to act on their duty to report a child needing protection in relation to immediate risks of self-harm, or suspected cases of child abuse or neglect, as required by the Nunavut's Child and Family Services Act. In this case, the disclosure of personal information to the relevant authorities is proportional to the need.

- **Evaluation:**

In terms of evaluation, we will be collecting personal information in the form of thoughts and opinions, as well as personal demographic information of users which are necessary and effective to inform decision making and improve services. This information will be collected anonymously and with care to be non-identifiable. It will be used only by the staff authorized to collect and analyze the information. Evaluation results will be publicly published without any attachment to the individuals (anonymously).

- 6) Legal Authority for the Collection, Use and Disclosure of Personal Information:** For each of the collection, use and disclosures identified, evaluate your public body's legal authority and complete the following table

Personal Information Authorities Summary			
7)	Personal Information Description/Purpose	Type	Authority
1.	Name, Age, Name of Parents, Signature, Use of space, liability waiver, allergy forms for Registration	Collection, Use	ATIPP Part 2, Division A: 40-42, Division B 43-46 PIPEDA schedule 1 6.1
2.	Email address, username, password for KMN Digital Platform Access	Collection, Use	ATIPP Part 2, Division A: 40-42, Division B 43-46 PIPEDA schedule 1 6.1
3.	Thoughts and opinions submitted as part of evaluation and/or consultation	Collection	ATIPP Part 2, Division A: 40-42 PIPEDA schedule 1 6.1
4.	Thoughts and opinion processed by Makerspace Org to inform decision making and improved services	Use	ATIPP Part 2, Division B 43-46 PIPEDA schedule 1
5.	Published evaluation results	Disclosure	ATIPP Part 2, Division C 47-49 PIPEDA schedule 1

Compliance with Personal Information International Disclosure Protection Act ("PIIDPA"): *PIIDPA* requires that personal information in the custody or control of a public body shall not be stored or accessed outside of Canada, subject to limited exceptions (s.5(1)). Set out here whether or not there will be any proposed storage or access outside of Canada and if so, describe what *PIIDPA* exceptions apply. See **Appendix D** for a summary of the *PIIDPA* exceptions.

The personal information collected, used, and disclosed as part of this initiative will be stored only within Canada.

D. Correction, Accuracy and Retention of Personal Information

1) How is an individual's information updated or corrected?

An individual may update their personal information for registration personally with Staff at the makerspace or communicated it by email to staff. As per internationally accepted privacy principles and good information management practices, the name and contact information of a staff person will be provided to all individuals at the time of collection, and will be available publicly. Information used for the SSO to access the network can be updated through one's profile at Makerspace computer. For evaluation information that has already been disclosed in published reports or to third parties (previously identified for and consented to) in the 12 months before a request for correction of that information is received – then the KMN will notify the third party of correction, and/or issue a correction/rectification.

2) If information is not updated or corrected (for physical, procedural or other reasons) please explain how it will be annotated?

If one wishes to submit additional evaluation information to update the thoughts and opinions provided, they can contact Makerspace staff to submit additional information.

3) If personal information will be disclosed to others, how will the public body notify them of the update, correction or annotation? (See s. 25 of *FOIPOP* for further information on correction and accuracy obligations).

No information will be disclosed to third parties other than evaluation information which will be published and collected anonymously. Additional evaluation information that is provided will be included as best as possible before publishing, and if after publishing, it will be included in the next annual report.

4) Does your initiative use personal information to make decisions that directly affect an individual? If yes, please explain.

Yes. Our initiative will collect personal information for evaluation in order to make decisions to better improve services for the individuals who use those services and provided their feedback. This will include what kinds of programming are available and how that programming is delivered.

5) Do you have a records retention and/or disposition schedule that will ensure that personal information is kept for at least one year after it is used in making a decision directly affecting an individual?

The personal information collected for evaluation informing decision making will be kept on file in the Makerspace office for at least a year so that the individual has a reasonable opportunity of obtaining access to it. After that time, and when the use of that personal information is expired or no

longer viable, we will prove to delete it securely either by shredding or electronic erasure.

E. Security of Personal Information

- 1) Reasonable security: Administrative safeguards** – Describe administrative safeguards (such as policies, training, contract provisions, consent forms etc.).

Administratively, we will develop policies that protect individual's privacy and that comply both with ATIPP, PIPEDA and internationally recognized privacy and information management practices. Staff will be trained with regard to privacy issues and contracts will be in place to limit the collection, use and disclosure of personal information without written and informed consent. The request for consent will be clearly described and articulated in each administrative form that requires the input of personal information – as will be the parameters for the use and disclosure of such information.

- 2) Technical Safeguards** – Describe technical safeguards (such as passwords and user ID, authentication, encryption, firewalls and intrusion detection, secure transmission, disaster recovery).

The technical safeguards include the Single-Sign-On authentication for makerspace computers to prevent unauthorized access to individual accounts. We will be using the Kerberos authentication technology, most commonly used by Microsoft Windows and which uses symmetric key cryptography and requires trusted third-party authorization to verify user identities. Additionally, each computer available in a Makerspace will contain anti-virus and firewall software.

- 3) Physical Safeguards** – Describe physical safeguards (such as secure access, laptops secured to desk, alarm systems).

The hard copy files and computers containing personal information will be securely stored in a separate room/closet in the Makerspace, which will be restricted to Makerspace staff and will be kept locked during out of office hours. The Makerspace building/room will be locked when not open to the public, and where possible secured with a building alarm system.

- 4) Auditing** – Describe auditing capability and strategies (audit logs, records of user activity, proactive and focused audit capacity).

At this point, we anticipate that the Makerspace Manager and IT manager will have the capacity to conduct audits and will be able to view the records of activity for different users in the digital network. Whether or not they will have access to saved user work is yet to be determined.

- 5) **Access Matrix** Access to personal information must be limited to those employees whose job responsibilities require that they access the personal information. Attach a copy of the user access matrix. A user access matrix will list all of the position types (eg. clerical, manager of investigations, finance director) across one axis and all of the personal information types (or file types or data modules) across the other. The matrix will identify by position which individuals will have access to the identified data.

	Registrant Information	User Data in Digital Network	Evaluation Data	ASIST related information
KMN Executive Director			✓	
Local Makerspace Manager	✓	✓	✓	✓
Makerspace Staff/Instructors	✓	✓	✓	✓
IT Manager	✓	✓		

F. Risk Mitigation

- 1) Assess the impact on privacy, confidentiality and security of personal information as a result of the new program or service or change and make recommendations for mitigation of privacy risks. See **Appendix F** for examples of risks and mitigation strategies.


Risk Mitigation Table

	Risk	Mitigation Strategy	Likelihood	Impact
1	Authorized user views record for personal reasons	Log all read only and change activity Oath of employment and confidentiality agreements Training	Likelihood increases with more users and more staff	More sensitive data results in higher impact More data exposed by incident results in higher impact

2	IT Manager fails to report privacy breach to Makerspace body	Define Contractual terms: Require reporting within 24 hours to Makerspace Manager Impose penalties for failure to report and late reporting	Severity of consequences for IT Manager may lower the likelihood	Same considerations as above
3	Users breach privacy of other users	Provide code of conduct training that includes specific policies on privacy and consent Implement adequate administrative, technical, and physical safeguards	Likelihood increases with more users Severity of consequences for users privacy breach may lower the likelihood	Same considerations as above

■. Approvals

Completed by:

 Pinnguaq Association Feb 25th, 2019
[Insert position] Date

Reviewed by:

Privacy Officer Date

[Insert position] Date

Approved by:

8) [Insert Executive Sponsor] Date

Waterloo
(no reviewed)

From: SC / VI (INFC)
Sent: March 7, 2019 11:58 AM
To: mchandy@regionofwaterloo.ca
Subject: Smart Cities Challenge - Successful Final Proposal Submission

Dear Matthew,

Congratulations! Your submission is ready to move onto evaluation following a completeness check (per the latest FAQs).

Thank you for your cooperation, patience, and hard work, especially during the past eight months. We are truly honoured to have worked with you and wish you the best of luck in the competition!

On a related matter, we have recently determined that it will not be feasible to post final proposals on the Infrastructure Canada website in a timely manner. Instead, we will take an approach similar to the application stage and publish your executive summary in both official languages on the Infrastructure Canada website with a link to the final proposal on your website. We understand that posting the final proposal on your website is not a requirement contained in the finalist guide so we appreciate your cooperation in facilitating access to your final proposal in an open and transparent way. Please note that the accessibility materials you have prepared for your final proposal will still be helpful in preparing various communications products to promote and share knowledge of your work.

Once you have posted your final proposal on your website, please send us the link if you haven't done so already. If you anticipate that you will be unable to post your final proposal on your website within two weeks, please let us know.

As always, we are happy to answer any questions. The best way to reach us going forward would be at our generic account: infc.sc-vi.infc@canada.ca.

Thank you.

Smart Cities Challenge Team
Infrastructure Canada
infc.sc-vi.infc@canada.ca

Jacaban2, Evalynne (INFC)

From: Long, Alexander (INFC)
Sent: March 7, 2019 4:07 PM
To: SC / VI (INFC)
Subject: FW: Smart Waterloo Region - Smart Cities Challenge Submission & PPIA

For records.

From: Jennifer Rees-Jones [mailto:Jennifer.Rees-Jones@ipc.on.ca]
Sent: March 7, 2019 4:04 PM
To: 'Shannon McIntyre' <ShMcIntyre@regionofwaterloo.ca>
Cc: Long, Alexander (INFC) <alexander.long@canada.ca>; Matthew Chandy <MChandy@regionofwaterloo.ca>
Subject: RE: Smart Waterloo Region - Smart Cities Challenge Submission & PPIA

Hello Shannon,

Congratulations on submitting the final proposal. This is to confirm that I'm able to access all of the documents.
 Regards,

Jen

Jennifer Rees-Jones
 Senior Policy Advisor
 Office of the Information and Privacy Commissioner/Ontario

(416) 326-3876
jennifer.rees-jones@ipc.on.ca

From: Shannon McIntyre <ShMcIntyre@regionofwaterloo.ca>
Sent: Wednesday, March 6, 2019 2:31 AM
To: Renee Barrette <Renee.Barrette@ipc.on.ca>; Jennifer Rees-Jones <Jennifer.Rees-Jones@ipc.on.ca>
Cc: Long, Alexander (INFC) <alexander.long@canada.ca>; Matthew Chandy <MChandy@regionofwaterloo.ca>
Subject: Smart Waterloo Region - Smart Cities Challenge Submission & PPIA

Hello Renee and Jennifer,

I am emailing you to share Smart Waterloo Region's submission to Infrastructure Canada's *Smart Cities Challenge*.

Our full application, including the final PPIA and supporting documents (in the Appendix C-Confidential Annex), is available in

DropBox: [REDACTED]

Please confirm you have received this email and that you are able to access all documents.

Thanks again for your support throughout this process,
Shannon

Shannon McIntyre M.Sc. (Planning)
Social Planning Associate
Smart Waterloo Region
150 Frederick Street, Kitchener, Ontario
T: 519-575-4400 ext. 3661 | C: [REDACTED]
E: shmcintyre@regionofwaterloo.ca

Jacaban2, Evalynne (INFC)

From: Long, Alexander (INFC)
Sent: April 8, 2019 12:55 PM
To: Jacaban2, Evalynne (INFC)
Subject: FW: Smart Waterloo Region proposal - Updated Financials

Follow Up Flag: Follow up
Flag Status: Completed

ATIA - 20(1)(b)

ATIA - 13(1)(d)

From: Long, Alexander (INFC)
Sent: March 11, 2019 12:53 PM
To: 'Matthew Chandy' <MChandy@regionofwaterloo.ca>
Subject: RE: Smart Waterloo Region proposal - Updated Financials

Thanks Matthew. It's now in our records. And to clarify, this document will not be submitted to the Jury as part of their review. It can be referenced if required.

Alex

From: Matthew Chandy [mailto:MChandy@regionofwaterloo.ca]
Sent: March 11, 2019 12:34 PM
To: Long, Alexander (INFC) <alexander.long@canada.ca>
Subject: Smart Waterloo Region proposal - Updated Financials

Hi Alex,

Please see attached updated financials for reference when reviewing the Smart Waterloo Region proposal. As we were working at the last minute on some formatting of the proposal, the wrong financial tables were inserted into the proposal

There are two sheets in the attachment, the summary table in Chapter 10 (Financial) and the full spreadsheet in Appendix A.

While I know that submitted document is the final version for assessment, I hope that the Jury can reference the attached document during their review, which includes this small change.

Please let me know if there are any questions regarding these updated tables.

Thank you,

Matthew Chandy
Smart Waterloo Region Lead
T. 519-575-4489

**Page(s) 588 to 602
are withheld
pursuant to paragraph
13(1)(d) and 20(1)(b)
of the *Access to Information Act***

**La/les page(s) 588 à 602
Font l'objet d'une exception totale
conformément aux dispositions de paragraphe
13(1)(d) and 20(1)(b)
de la *loi sur l'accès à l'information***

COMPLETE CHECK FOR FINAL PROPOSAL

FINALIST: Waterloo Region				
ASSESSED BY: Alex Long				
VALIDATED BY: Amanda Aizlewood				
APPROVAL BY: <i>select one: Jenny Tremblay / Eric Poirier</i>				
DATE OF COMPLETION: <i>enter date when all completed boxes are checked</i>				
REQUIREMENTS	COMPLETED	IF NOT COMPLETED, NOTE REASON	GUIDING PRINCIPLES	ACTIONS
SUBMISSION				
Submitted to infc.sc-vi.infc@canada.ca by 23:59 PST on March 5, 2019	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> No extensions will be granted No exceptions will be made for lateness or technical problems (finalist must be able to show evidence of submission) 	<ul style="list-style-type: none"> # to contact finalist If not resolved, # to flag to DG for decision
Final proposal is submitted	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> No extensions will be granted There is flexibility on the finalist video until the end of the week 	<ul style="list-style-type: none"> Assessor to save everything in designated folders # to contact finalist if anything is missing If not resolved, # to flag to DG for decision
Finalist video is submitted	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> There is flexibility on the finalist video until the end of the week 	<ul style="list-style-type: none"> Assessor to save everything in designated folders # to contact finalist if anything is missing If not resolved, # to flag to DG for decision
Preliminary Privacy Impact Assessment or Preliminary Rationale Analysis	<input checked="" type="checkbox"/>	Contained in confidential annex	<ul style="list-style-type: none"> No extensions will be granted 	<ul style="list-style-type: none"> Assessor to save everything in designated folders # to contact finalist if anything is missing If not resolved, # to flag to DG for decision
FINAL PROPOSAL				
Written in one of Canada's official languages	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> If the final proposal is submitted in a language other than English or French, a companion version in English or French is required from the finalist 	<ul style="list-style-type: none"> # to extract the executive summary from the final proposal and send it to translation (if a French final proposal, send the entire document to translation)
Generally readable (e.g. picture is not covering text, text are not overlapping)	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> If there are serious formatting issues that hinders readability, the finalist may need to resubmit 	<ul style="list-style-type: none"> # to do a scan of the final proposal and verify that all text and tables, graph, etc. could be read
Text-based and in either MS Word (.doc or .docx) or a fully readable, searchable, and selectable PDF (.pdf) format	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> Finalist may adjust the format for INFC posting purposes after the deadline 	<ul style="list-style-type: none"> # to verify with Comms if format is suitable for posting, given INFC web accessibility standards If not suitable, # to contact finalist
No longer than 75 pages* (Financial chapter exempted) and in 12 point font	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> Finalist cannot adjust content after the deadline If the text overall is smaller than 12 point font, INFC will adjust and evaluate within the new page count 	<ul style="list-style-type: none"> # to notify finalist if final proposal is over 75 pages # to notify finalist if INFC had to adjust the font and page count

Contains an executive summary	<input checked="" type="checkbox"/>			<ul style="list-style-type: none"> # to QC and save translated version into the designated folder
Organized by these distinct chapters (not limited to these; not necessarily in the same order): <ul style="list-style-type: none"> Vision Performance measurement Project management Technology Governance Engagement Data and privacy Financial Implementation phase requirements 	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> Finalist must have these chapters Finalist can have more chapters Finalist can change the order of the chapters 	<ul style="list-style-type: none"> If the chapters are not clearly labeled, # to do a light analysis of where the content may be and make a note for the Jury
FINALIST VIDEO				
No longer than five minutes	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> Finalist may cut down the time for INFC posting purposes after the deadline 	<ul style="list-style-type: none"> # to notify finalist if video is longer than five minutes and needs cutting down
Submitted as a file or in a downloadable format	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> Finalist may adjust the format for INFC posting purposes after the deadline 	<ul style="list-style-type: none"> # to verify with Comms if format is suitable for posting, given INFC web accessibility standards If not suitable, # to contact finalist
CONFIDENTIAL ANNEX (OPTIONAL)				
Submitted if and only if required	<input checked="" type="checkbox"/>	Contains PPIA		<ul style="list-style-type: none"> # to flag with DG if confidential annex is lengthy

Jacaban2, Evalynne (INFC)

From: Matthew Chandy <MChandy@regionofwaterloo.ca>
Sent: March 6, 2019 2:33 AM
To: SC / VI (INFC)
Cc: Long, Alexander (INFC)
Subject: Final Proposal – WATERLOO REGION

Good Evening Smart Cities Challenge Team,

Please accept this email as Smart Waterloo Region's final application submission to Infrastructure Canada's *Smart Cities Challenge* representing the communities of eight communities of Waterloo Region (Region of Waterloo, Cities of Kitchener, Waterloo and Cambridge, and Townships of Wellesley, Wilmot, Woolwich and North Dumfries).

Link to full application submission:

[REDACTED]

Link to pitch video and script:

[REDACTED]

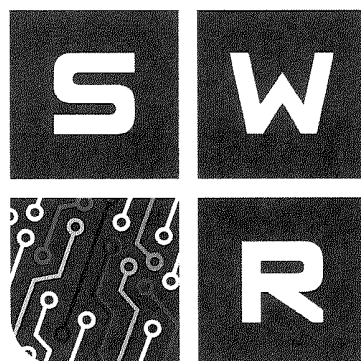
Please confirm receipt of this e-mail with the attached documents.

If you have any further questions, please contact me directly at 519-575-4489 (O) [REDACTED]

Thank you,

Matthew Chandy
Smart Waterloo Region Lead
T. 519-575-4489





Smart
Waterloo
Region

Smart Waterloo Region Proposal

  @SmartWatRegion

#smartwr #bestcommunity4kids

www.smartwr.ca

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1. Executive Summary

Waterloo Region is a community full of startups, tech companies, advanced manufacturing, high finance and world-class academic institutions. When the numbers showing that children and youth in the community weren't doing well, it was shocking. So regional stakeholders came together to try and understand what was going on. Why graduation rates were low. Why vulnerability to children in the early years was worsening.

The fact is Waterloo Region – like Canada as a whole – isn't the best place in the world to be a young person. It's average. (Maybe below average.) But that can change. And Smart Waterloo Region (SWR) is going to change it, by doing some of the things this community does best: collaborating, creating cool tech, innovating and getting the community involved.

Smart Waterloo Region Challenge Statement

We will become the benchmark community in Canada for child and youth well-being by using early intervention, youth engagement and a connected-community framework to create adaptive, data-driven programs and scalable learning technologies that improve early child development, mental health and high school graduation rates.

The SWR initiative is a \$155M project. Its aim: to work with community partners, experts and tech companies to design, develop and deploy technology and data enabled programs and services with the intent to improve child and youth well-being. In partnership with UNICEF Canada, SWR will create and launch a data platform to collect, house, analyze and use data that feeds understanding of the complex nature of well-being, and to give the right people (children, youth, families) the right information or the right technology at the right time. The scope of SWR activity is intended to reach deeply and widely into the community to enhance child and youth well-being for as many residents as possible.

Through a ground-breaking partnership with UNICEF Canada, and based on significant evidence from community engagement and research, SWR has identified important root causes, areas of need and potential technology- and data-driven solutions that might help. SWR worked directly with children and youth, government, school boards, tech firms, child and youth service partners, Indigenous people and more to identify why and how technology and data-enabled solutions might improve child and youth well-being, specifically in the areas of early childhood development, literacy, mental/emotional health and sense of belonging.

The list of solutions addresses nearly all aspects of the community - with supports for things such as for rural education, Indigenous STEAM programming and resources to help new Canadians get connected. And through the UNICEF Canada partnership, SWR will create the capacity to better understand the nature of well-being, and the impact of programming in the region and – once scaled – across Canada through a data-rich platform. The SWR Data Collaborative platform, has proven that SWR can pull data from organizations of all sizes and all geographies provide meaningful analysis on key factors related to child and youth well-being.

Waterloo Region does things differently. Some say it comes from barn raising roots - from a time when neighbours came together to help neighbours. Or it's from the entrepreneurial ecosystem which prizes agility and adaptability. Whatever the case, Waterloo Region is a small competitor in a big category, and every bit of funding goes further here. It makes a bigger impact.

Children and youth in this community need help. And that's what drives Smart Waterloo Region; the idea that everything planned here, can make a difference in every child's life, for the rest of their life. In short, when Waterloo Region wins, Canada wins.

2. Vision

Connected. Daring. Collaborative. These are hallmarks of Waterloo Region. It's a community with substantial assets, a strong economy, committed people and a grass-roots desire to affect change and increase the quality of life for everyone. Despite the success story of Waterloo Region, local children and youth are in trouble.

At least one in five children and youth in Waterloo Region are struggling in critical areas that are foundational to well-being: early childhood development, literacy, mental/emotional health and sense of belonging. This struggle will affect them for the rest of their lives. This is not acceptable. And what became crystal clear during Phase 1 and 2, through evidence gathering with community partners and engagement with children and youth, is that the community doesn't believe it is acceptable either.

Waterloo Region needs change. Smart Waterloo Region (SWR) has identified areas where technology and data can support well-being – areas such as skill development, fostering relationships between people, connecting children, youth and families to services, information, support, health, education - all building blocks of well-being and positive future outcomes.

It will happen. Waterloo Region will be transformed into the best community in Canada for children and youth. It won't stop there, though. The data, technology solutions, everything learned will be shared so Canada can be better too. SWR's collaboration with UNICEF Canada will help to make that a reality and help Canada become the best country to grow up in.

What do the numbers say?

Early Childhood Development:

Approximately one in three children in Waterloo Region are vulnerable and not ready for school with the skills they need.

Literacy: Since 2013, approximately one in five students in Waterloo Region have successfully completed the Ontario Secondary School Literacy Test (OSSLT).

Mental/Emotional Health: Approximately one in five youth in Waterloo Region do not report positive mental health.

Sense of Belonging: Only one in five youth in Waterloo Region report having a very strong or somewhat strong sense of belonging to their community.

2.1. Partnership with UNICEF Canada

UNICEF Canada is leading a movement to advance the well-being of children and youth across the country. Through its One Youth initiative, UNICEF Canada has set a bold goal for Canada to be the best place in the world to grow up in by 2030. UNICEF Canada and SWR share a common goal and have established a partnership to make a difference in Waterloo Region and across the country. This partnership includes the following:

- UNICEF Canada is supporting SWR as it adopts and adapts UNICEF Canada's Canadian Index of Child and Youth Well-being (CY-Index) for use in a local context. Other communities in Canada will be able to leverage SWR's learnings and tools for using the CY-Index, and measuring child and youth well-being at the community level
- UNICEF Canada and SWR are collaborating to develop the Child and Youth Well-being Dashboard, based on the CY-Index in Waterloo Region. The Dashboard will be prototyped in here and made available to other communities across Canada
- UNICEF Canada and SWR will work with the Children and Youth Planning Table of Waterloo Region (CYPT) and other partners to develop a community survey of children and youth that will support critical data collection, innovate new approaches to engaging youth and build capacity to deploy the survey and engagement in other communities
- UNICEF Canada will leverage and contribute the organization's global leadership to define and support the rights of children in relation to data across all stages of the implementation of the data cycle, including protection and participation

- SWR and CYPT will support the design and implementation of UNICEF Canada's approach to UNICEF's global Child Friendly Cities Initiative (CFCI) – enabling public recognition of local government investment and goals to improve the conditions and quality of life for children and youth
- UNICEF Canada will help connect international contributors to the planned Centre of Excellence for Child and Youth Well-being (Chapter 4) and identify opportunities to share good practice beyond Canada's borders

When UNICEF Canada leverages the local efforts of SWR, and SWR leverages the national work of UNICEF Canada, efforts and impacts of both will be greater. Children and youth in Waterloo Region, as well as the rest of Canada, are poised to benefit greatly from this partnership.

2.2. Why Waterloo Region

Waterloo Region leveraged its barn-raising beginnings, created a robust innovation ecosystem and is now recognized for excellence in technology, advanced manufacturing, finance and education across Canada and around the world. The talent, entrepreneurial spirit and research excellence are here. The policy makers, social researchers, governance experts and data experts are trained here. They live, work and raise families here.

A spirit of cooperation, camaraderie and concern is an integral part of Waterloo Region. It seeps into working life, neighbourhoods and is most evident in the concern community members show for each other. In short: Waterloo Region has the right constellation of attributes and attitudes to get this important work done. And it offers all types of communities in one: cities, small towns and rural townships. Waterloo Region is the perfect location to test, deploy and learn how to scale up and scale down solutions because every context exists right here.

Waterloo Region is not the largest community in the *Smart Cities Challenge*, and that's an advantage. It's small enough to move quickly, gain consensus easily and make things happen. It's big enough to attract significant resources, find talent and capture important input from a broad cross section of people: all ages, all genders, all backgrounds. Most importantly, Waterloo Region punches above its weight.

- It's nimble and adapts to challenges and changes quickly
- It's responsive and can get the right answers from the right people in a phone call
- It's innovative with more patents than anywhere else in Canada, and over 150 research institutes and innovation hubs
- It's risk-taking and is the birthplace of ideas that have changed the world
- It's ready. Agreements are in place, organizations, government and business are on board and the community is mobilized

In short, SWR will make a big impact. It will change the game because this community has the will, the resources and the desire to make a difference, to make all children and youth here – and in Canada – happy, healthy and safe.

"Waterloo Region is not afraid of setting bold goals and measuring them. If every big city in Canada had such resolve, Canada would be much closer to the top of UNICEF league tables of child and youth well-being." - UNICEF Canada, Where Does Canada Stand? 2019

2.3. Wayfinding and Staying the Course

In Phase 1, SWR worked with CYPT and Wellbeing Waterloo Region (WWR) to select six areas of focus as the areas of greatest urgency for child and youth well-being, and areas where community organizations were ready to provide support:

- Bullying;
- Early childhood development;

- High school graduation;
- Literacy;
- Mental / emotional health; and
- Sense of belonging.

SWR and CYPT tested these areas in Phase 2 – seeking to better understand each area, as well as the interconnections between them. Research and analysis included collecting data across all dimensions of child and youth well-being, extensive community engagement (see Chapter 3), consultation with researchers and organizations at the forefront of child and youth well-being, and primary and third-party research (primarily occurring in Phase 1). The work also included direct engagement with children, caring adults and child and youth professionals to better understand and map the root cause issues getting in the way of greater impact (see Appendix A for the problem map and research).

CYPT

The Children and Youth Planning Table of Waterloo Region is a community-wide partnership. The partnership includes over 500 individuals representing service providers, researchers, planning bodies and funders serving children, youth and families in Waterloo Region.

This work led SWR to narrow to four areas of focus (early childhood development, literacy, mental/ emotional health and sense of belonging) and increase the importance of addressing root causes.

Findings

Areas of Focus

These are the four areas where SWR can have the greatest impact. The evidence SWR uncovered, and discussion with community partners, was clear: bullying and low high-school graduation rates are outcomes of poor experiences in each of these four focus areas. SWR implementation will focus on addressing the four areas described below – because they each contribute to meaningful well-being outcomes in general, and because research indicates that all have an impact on bullying and high school graduation. For example, children and youth (and all people) have a fundamental need to belong. When children and youth feel excluded by peers, their sense of belonging may become threatened, and they may attempt to solve the problem through bullying behaviour. Another example - the first five years of life are a critical developmental period. The experiences and health of children during this time set the foundation for thinking, cognitive and emotional skills. These skills are predictive of later success in many domains - including high school graduation (see Appendix A for full listing of research).

Early childhood development	Literacy	Mental and emotional health	Sense of belonging
The early years from conception to age five have the most important influence of any time in the life cycle on brain development and subsequent learning, behaviour and health.	Literacy is strongly connected to well-being; Health Canada identifies literacy as a major determinant of health. Research has established a strong	Children and youth with good emotional health, and self-regulation skills, can better understand and manage their emotions and the emotions of others. This contributes to building healthy	Feeling a social and environmental connection gives children and youth a sense of stability, helping them deal with challenges and uncertainty.

Early experiences and relationships help guide healthy cognitive, emotional, and social development. Investing in the early years has a direct impact on economic, social, and health outcomes for both individuals and society.	connection between literacy, economic security and well-being. Canadians with lower literacy skills are more likely to be unemployed, work in lower-paying jobs and live in low-income households.	relationships with peers and caring adults in their life, and the ability to cope with challenges.	Those with a strong sense of belonging are more likely to have social networks and be engaged in their community.
---	--	--	---

Root Causes

In order to make a real and lasting impact on child and youth well-being, work has to be done to address root cause issues. Root cause issues are harmful factors or conditions that have impact across a child or youth's life (see Chapter 3 and Appendix A). By addressing issues that run underneath well-being challenges (e.g., unequal access to services, stigma) SWR can help shift the underlying, contributing factors and, in some cases, affect change across all focus areas simultaneously. SWR can create solutions that help move the needle on child and youth well-being in Waterloo Region through new applications of technology, or changes to policies or practices based on robust data.

"The foundations for adult success and failure are laid down early in life. Children raised in disadvantaged environments start behind and usually stay behind throughout their lifetimes."

The Economics of Child Well-Being. IZA, 2012. <http://ftp.iza.org/dp6930.pdf>

Connectedness and Relationships

The development and deepening of significant collaborations within and outside Waterloo Region will continue to be a significant part of SWR. Notable collaborations have led to:

- A successful pilot of the SWR Data Collaborative which will allow the community to leverage data to better understand the well-being of children and youth
- The mobilization of technology firms and organizations in creating or tailoring open, scalable, interoperable, future-proofed solutions to help children and youth across Canada
- The integration of youth into the design and development of SWR strategic planning, project design, pilots and assessment
- The deepening of relationships with underserved and/or underrepresented segments of the community

Evidence-Informed Decision Making

SWR has committed to decision making based on the best available evidence, gathered from a variety of sources including:

- Quantitative and qualitative data related to the well-being of children and youth (e.g., CY-Index Measures)
- Best available research (e.g., post-secondary partners, UNICEF Canada. See Appendix A.)
- Engagement with community: school boards, social-service organizations, technology, data and privacy sectors, and children, youth and caring adults

Technology- and Data-Enabled

Children, youth and families exist in a digital age. They interact with technology everyday. Technology-enabled solutions are reflective of the way the world works, and they allow for greater impact and reach. More children, youth and families will be able to benefit from the supports and information available in the community with the help of technology. SWR also provides an opportunity to intentionally examine the role of technology in society and foster a community dialogue on what is healthy and supportive, versus disconnected and harmful. This will help ensure that ultimately, the incorporation of technology is for the benefit of children, youth and families and not the detriment.

"If you can't measure it, you can't improve it." - Peter Drunker, management consultant, educator and author

People want to improve outcomes for children and youth. They want to know that their investment of time and other resources is making a difference. SWR will make available high-quality, meaningful data that will support the very best measurement and knowledge of child and youth well-being. Measurement will be possible like never before, and the ability to make improvements to child and youth well-being will be unprecedented.

2.4. Why Child and Youth Well-Being is Smart

The 2017 [UNICEF Report Card Building the Future](#) ranks the well-being of children and youth in 41 countries. Canada is just...average, ranking at 25th. It's shocking and upsetting, because most assume Canada is faring well when it comes to well-being, and because everyone wants children to have the opportunity to live up to their potential. For a variety of reasons, that's just not happening; Canada isn't the best place in the world to grow up.

That's not the only reason why this community, and this country should be concerned with child and youth well-being.

"From an economic perspective, what should be apparent is that children's health and wellbeing are the foundation of future economic success. Early interventions that address known public health problems in children can have enormous payoffs in the future." [Raising Canada Report, 2018](#)

In Waterloo Region, businesses see an economic problem looming on the horizon. Companies know that employees weigh how the community supports children and youth (e.g., how local schools compare, family supports offered) as one of the first criteria when considering relocation. They understand that a community with poor child and youth outcomes will not attract talent. They also understand that children and youth are the future work force and the innovators of tomorrow. Unless they aren't; unless Waterloo Region continues to lag in fostering child and youth well-being.

SWR is an investment in the future. It's an investment in leveling the playing field for children, youth and families – especially those furthest from opportunity. It's an investment in better futures for young people and communities. And a better future for Canada.

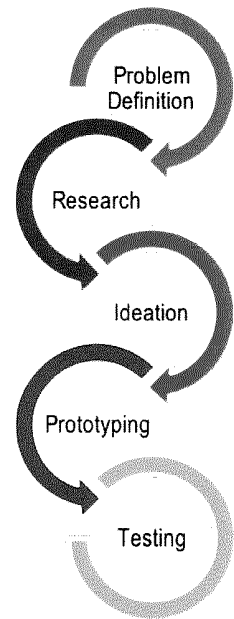
This is SWR's checklist. The insights and learnings that have served and will serve as touchstones for SWR. It looks simple, but it's not. Each of these has context that is unique to this community and this process.

The Checklist		
Base decisions on evidence	Solve systemic problems	Connect and collaborate
Address root causes	Enhance human connection	Measure everything, measure often
Engage community – often	Reach those furthest from opportunity	Data is power
Engage children and youth directly	Design for all	People want to help
Break down silos		

3. Engagement

SWR engagement is based on a continuous cycle of defining, developing and checking-in to make sure plans and projects accurately meet the needs of the community. (See Design Thinking in Chapter 8) Through the project, SWR has and will continue to:

1. Attract people from every corner, sector, group and age (because they are the community), and with them...
2. Describe and understand needs, gaps and problems (issues) through consultation and research
3. Check-in to verify that a) SWR has the right set of priorities and b) the right understanding
4. Come up with creative ways to solve, mitigate or reduce issues, and then test those ideas
5. Talk about what's going on – in person or through other channels – to update and include the community regarding progress, changes and needs
6. Refine approaches and repeat

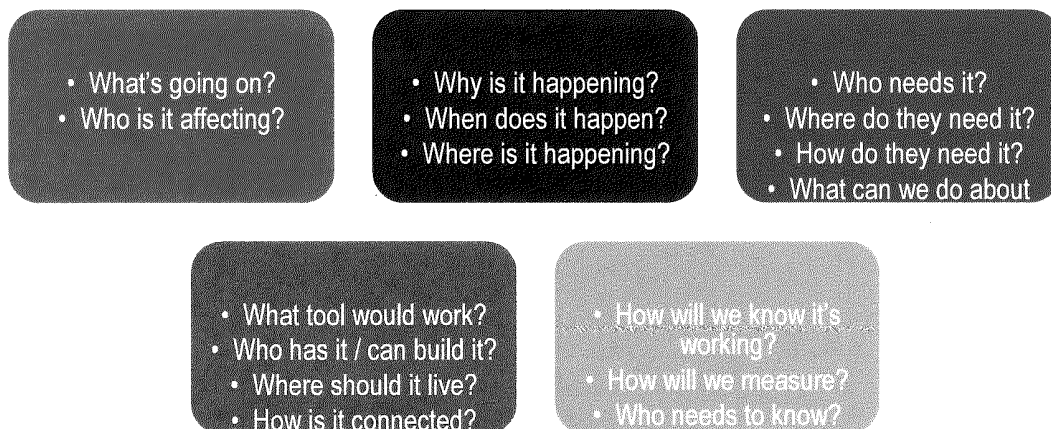


SWR used this engagement approach because it's important that this project is holistic and inclusive. Input happens continuously – at any point in the cycle, with any stakeholder. Engagement can include scheduled events like hackathons with youth, meetings with rural groups or an ideation session with a tech company CEO. It can also include spontaneous input like commentary via social media, or community conversations on changing policy.

3.1. Phase 2 Engagement

Phase 2 was about fully defining the “problem” and thinking about how SWR might use technology to solve or alleviate it. Most of the work involved developing an evidence-based understanding of the constellation of root causes, socioeconomic effects, and social pressures that have an impact. Then it moved to, thinking about how to affect and measure using technology and data as enablers.

Phase 2 was intended to answer the following questions leading into implementation.



3.1.1. Connecting to Expertise

SWR, CYPT and community partners explored child and youth well-being extensively. Activities included:

- Research (provincial, national), including direct engagement with children and youth.

- Extensive engagement in the community including child and youth serving organizations, caring adults and youth. Included discussion about the challenges or barriers faced by children and youth.
- Examining system-wide child and youth well-being data to understand how children and youth are faring across all dimensions of well-being (see Appendix A)
 - Analysis of data over time to understand trends (i.e., where Waterloo Region is getting worse or better over time)
- Analysis of outcomes, across municipalities, townships and – where possible – across neighbourhoods
- Accessing best practices from other communities, as well as national and international efforts related to child and youth well-being (see Appendix A)

3.1.2. Connecting to Community

Starting with known organizations through CYPT, and networks of CYPT member organizations, community networks and groups, SWR began collecting opinions, insights and information from the community. To get more deeply into the community, SWR accessed networks via organizations and individuals in the technology, education, social service sector and other partners to make connections and engage with the widest possible diversity of people in Waterloo Region including:

- Local youth: informal youth participation, as well as, the Smart Cities Innovation Council: Youth Unite Here (SCIC YUH, a group of local youth representatives who came forward on behalf of the community to co-design SWR activities and extend engagement efforts via their established networks)
 - Over 2,000 children and youth in the Region supported SWR through online supporting signatures (petition, see Appendix C)
- Community and social service groups through the CYPT's 70+ member organizations, including: EarlyON Child and Family Centres, education, social and mental health organizations, central and rural libraries, community centres, etc.
- Rural community organizations: Rural Child and Youth Wellbeing Initiative (RCYW) and others throughout the townships
- Diversity and welcoming groups: Carizon, KidsAbility, OK2BMe and English language support, Indigenous (see Appendix A), Low German, and multicultural groups
- Technology groups and companies, including: Communitech, CivicTech Waterloo Region (representing a cross-section of technology and data experts from across the Region), and many others throughout Waterloo Region
- School Boards: conseil scolaire Viamonde, KidsAbility School Board, MonAvenir conseil scolaire catholique, Waterloo Catholic District School Board (WCDSB), and Waterloo Region District School Board (WRDSB)
- Post-secondary and research institutions: Conestoga College, Wilfrid Laurier University (WLU), the University of Waterloo and Perimeter Institute
- Partner municipalities: representatives from the three cities and four townships assisted
- Provincial organizations: Ontario Ministry of Education
- National organizations: UNICEF Canada, YMCA National Network

One of the amazing outcomes of community engagement has been that SWR has made stronger connections within Waterloo Region, including new relationships with organizations that are atypical in the child and youth well-being space (for instance, tech companies), and deeper working relationships with known groups (e.g., local Indigenous-serving organizations). SWR has identified a need to add more individuals and groups representing newcomers, non-English speakers, those with disabilities, voices of very young children and those living with low income to future

engagements. In implementation, longer timelines will enable deeper relationships and support engagement with these community groups.

3.2. Events

In Phase 2, SWR undertook extensive community consultation - including organized meetings, youth workshops, communication outreach and events. These engagements spanned from one-on-one meetings through to large scale community forums. Key engagements throughout Phase 2 are included in the table below, representing over 1,500 participants. Each event was supported by community partners from different sectors in Waterloo Region.

Event	Description of Engagement
1 CYPT and Youth Stakeholder Lab	Root causes
1 CYPT Stakeholder Lab	Root causes problem statement session
1 Youth Research Session	Define meaningful youth engagement (see Appendix A)
1 CYPT Working Group	Root cause validation
1 Youth Validation Session	Root cause validation
3 SWR Launch Events	Raise awareness and engagement in SWR initiative, input via Conversation Toolkit
5 Feedback Sessions	Mini-engagements hosted by partners to engage children and youth and community members using the Conversation Toolkit (see Appendix A)
4 Stakeholder Labs	Idea generation of solutions by each area of focus
4 Pop-up Events	General ideas regarding child and youth well-being, and gather input into problem statements (i.e., root cause work)
1 Youth Engagement Forum	Design-thinking sessions co-designed with youth. Included idea generation, prototyping and testing around the prioritized problem statements (i.e., root cause), life skills
1 Street Team Survey	Youth Advisory members who leveraged their networks to get feedback re: general well-being and issues that their peers experience.
1 Hackathon	Hackathon using the outcomes from Stakeholder Labs to iterate and create prototypes to inform solution development
3 Pop-up Events	Engagement re: problem statements and prototyped ideas to gather feedback and understanding
10 Pop-up Events (4 facilitated)	Testing of prototypes from Hackathon
French survey, online	Requested feedback regarding prototyped ideas. Helped with validation

Key Engagement Events - Phase 2

Root Cause Stakeholder Lab

On June 12th, SWR and the CYPT brought 174 participants together to explore the obstacles to well-being children and youth face in this community. Participants included youth, parents, and representatives of child-serving organizations. The goal of the day was to map the problems that prevent improvements in child and youth well-being, define problems, and provide a foundation and common understanding for child- and youth-focused initiatives in Waterloo Region moving forward.

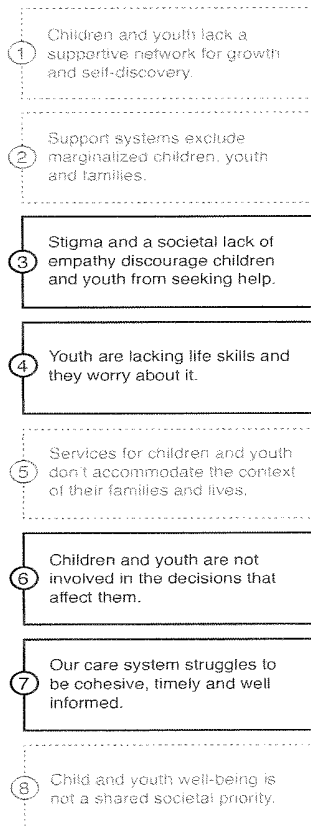
Participants worked in groups to identify obstacles in each of the original six priority areas, using a consensus building approach to uncover themes, and explore the many factors affecting child and youth well-being. Better understanding of the problem from the perspectives of those involved has led – and will continue to lead – to better solutions.

One of the event outcomes was an interconnected map of societal, socio-economic and systemic circumstances that impact child and youth well-being directly and indirectly (see full report in Appendix A). Exploring the layers, causes and symptoms that impede child and youth well-being led to the development of eight overarching root causes impacting SWR's focus areas (see diagram below). This consultation led to further evidence development. The results had impact on SWR's go-forward strategy:

- Identification of two areas of focus (high-school graduation and bullying) as outcomes rather than distinct focus areas (see diagram below)
- Reduction of focus areas from six to four (early childhood development, literacy, mental/emotional health and sense of belonging)
- Identification of eight root causes impacting child and youth well-being
- Mapping the impact of root causes against areas of focus

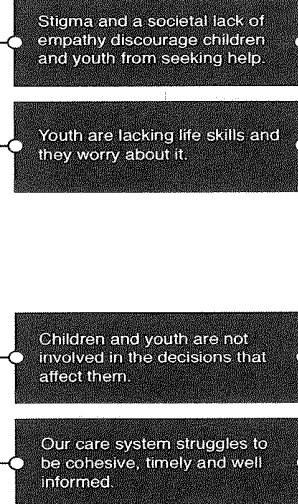
- Identification of root causes having impact across more than one area of focus
- Prioritization of four root causes as a starting point for SWR

From the stakeholder sessions, eight root cause areas of focus were identified.

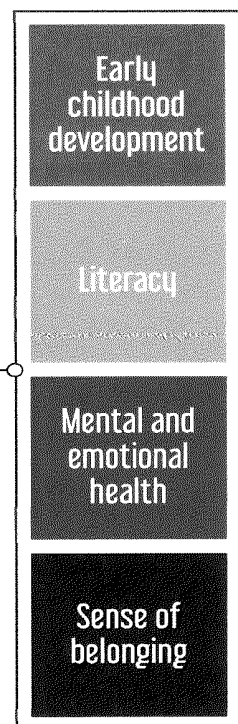


Child and youth well-being

From the eight, four areas of focus (problem statements) for this project were prioritized as a starting point.



These areas of focus, if addressed properly, will have an impact on:



Youth Hackathon

Child and youth engagement was a critical part of Phase 2. SWR wanted to make certain that the voices of young people were heard, they were directly involved in co-designing solutions, and that youth were part of ongoing implementation efforts. SWR hosted a large-scale, day-long, design-thinking Youth Engagement Forum on January 12th, 2019.

The Youth Engagement Forum brought together over 120 youth from across the Region. Attendees (ages 12-18) represented the diversity of the Region from different cultural, socioeconomic, LGBTQ2+, urban and rural communities.

Co-created with the Youth Advisory Committee, the Forum took shape as a mini-design cycle, with engagement activities created to define, research, ideate, prototype and test solutions with and for youth. From these activities SWR gained further insight into how young people think about well-being, confirming extensive research and helping to structure solutions.

The feedback received from the youth attendees was inspiring and electric. Many participants saw this opportunity as a time and place for their voices to be heard, where they took ownership and invested in their future.

Youth told SWR that these types of engagement events are important to them, including smaller, casual events held regularly in addition to larger forums. During implementation, SWR will host similar events and iterate on this experience, incorporating youth feedback to co-create future engagements.

Youth-Centred Design

SWR used UNICEF Canada's Youth-Centred Design process to gather feedback from children and youth. Including them in the design process yielded more meaningful, impactful and authentic solutions. UNICEF Canada's Youth-Centred Design Toolkit provides guidelines, workshop tools and techniques that child- and youth-centred organizations from anywhere in Canada can leverage to include children and youth in the development of policies, programs and other actions.

3.2.1. Communications

To support engagement efforts and to create awareness and excitement throughout the community, SWR ran a robust communications campaign from November 2018 to February 2019. The campaign leveraged traditional media (print, radio, web), social media (Twitter, Instagram, Facebook) and the SWR website (www.smartwr.ca). Total impressions and reach totaled over 1 million.

Traditional media

- Radio ad campaign and radio interviews, reaching over 250,000 local listeners
- Articles about SWR ran in Kitchener Today and Waterloo Region Record print media, on the CBC and Global News websites, on 570News and CBC Kitchener-Waterloo radio stations and local podcasts

Social media

- From November 2018 to February 2019, the @SmartWatRegion Twitter handle received over 836,000 tweet impressions, and attracted over 400 new Twitter followers
- Attracted over 300 new Instagram followers
- Launched Facebook account garnered feedback and input from social media channels in response to content

Website

- Over 5,000 community members were informed through the SWR website
- Engaged community members by asking in-depth and long form questions

In addition to traditional media, social media and website engagement, SWR leveraged an extensive network of communicators from partner and community organizations. This network promoted rich, shareable content provided

by SWR, helping to raise awareness of events, general information and engagement opportunities in the community. This collaborative communication strategy was extremely successful and will be leveraged during implementation.

3.3. Engagement During Implementation

Insights Informing Implementation

All engagement, through implementation, will be iterative. Learnings, insights and feedback will support technology and data-enabled solution development, project improvements, and will inform SWR practices, communication strategies and governance considerations. The following insights came from Phase 2 engagement and will remain central to engagement during the implementation phase.

- Address root causes to affect change
- Solutions must enhance – not replace – human connection.
- Solutions must reach young people and families furthest from opportunity and of all ages
- Generate, refine, and test ideas that solve system issues

“Old problems need fresh solutions, and that’s why listening and co-creating with youth is so important.” - Meena Waseem, age 17, SWR Youth Advisory Committee

3.4. Implementation Engagement

Implementation will be about building, testing and refining solutions and results using an agile framework. SWR will use the continuous cycle of defining, developing and engaging to make sure beliefs, plans and projects accurately meet the needs of the community.

The timeline for engagement in implementation will be flexible but will loosely be structured around quarterly cycles that will provide a framework for the Implementation Team to plan, execute, learn and adapt. Each cycle will start with a kick-off and planning time when the team will identify engagement priorities, audiences, and tools. This will include the Youth and Adult Advisory Committees (see Chapter 7) and other key stakeholders. Each cycle will end with reflection in the form of a retrospective.

SWR cannot accurately prescribe the number of engagement events and the types of tools us ahead of time, as these approaches need to be flexible and oriented around the development of solutions (see Chapter 4).

Communications & Engagement

SWR will continue to communicate with the community via online and other media tools. Information regarding communication may be found in the Project Management section.

During the initiation kick-off and planning phase, SWR will develop a fulsome community engagement strategy with particular focus on meaningful child and youth engagement. The strategy will include a schedule for labs, surveys, youth events etc. as part of:

- Feedback to inform upcoming SWR engagement cycle plans
- Implementation of individual solutions

3.4.1. Engagement Tools and Events

SWR will continue to use proven tools and events to engage the community and feed the design cycle. These events will include:

Tools	
Toolkit Labs	<p>The Idea Toolkit engages children and youth in creative activities that respond to the SWR focus areas.</p> <p>The Conversation Toolkit is designed to gather caring adults perspectives and engage parents of children too young to engage with the Idea Toolkit or other design-based activities (ages 4 and under).</p> <p>The Phase 2 toolkits may be found in the Appendix A</p>
Online	<p>SWR will employ social media tactics using simple questions (i.e. Instagram story polls) to provide information and gain input.</p> <p>The website will include long-form questions for consideration and feedback and act as the central source for communications.</p> <p>Remote sessions (by video conference) and online surveys may help engage with rural, those with disabilities and multilingual stakeholders.</p>
Surveys	SWR will continue to use surveys (online, in-person, facilitated) as appropriate to gather feedback from the community
Hackathons	SWR will work with partners in the technology sector to host a Hackathon event twice per year. Based on learnings from Phase 2, SWR will host smaller, integrated Hackathons with the technology, education and social services sectors and children and youth to co-create, iterate on and test solutions.
Youth Events	<p>SWR will work with the Youth Advisory Committee and local children and youth to co-create and host youth events throughout implementation. Two large engagement events (similar to the Youth Engagement Forum) will be hosted throughout the year. Smaller events will also take place throughout the community, dependent on need and children and youth input.</p> <p>SWR will work with technology partners to integrate various technology such as gamification to support ideation.</p>
Summit Event	The Child & Youth Well-being Data Summit is proposed as an annual forum to discuss the CY-Index, children and youth engagement in data, data-related innovations, and privacy and security issues relating to children and youth. The Summit would be held in partnership with UNICEF Canada, CYPT and other partners at the Centre of Excellence (COE) and draw an audience of researchers, social service organizations, youth and government representatives from across Canada and around the world.

3.5. Diversity During Implementation

SWR will reach a broad cross-section of the community by leveraging the existing relationships and networks of key partners involved in the SWR work. SWR will rely on the Youth Advisory Committee and Adult Advisory Committee to ensure SWR is inclusive and considerate of the diversity of residents and the ways in which various groups could be affected by projects.

In addition to engaging diverse groups of children and youth, SWR will employ the above listed tools to engage diverse groups of adults and older adults. Recognizing that diversity comes in all ages, genders, backgrounds and abilities, SWR will work to ensure the entire community is informed and engaged in the project through implementation.

4. Technology- and Data-Enabled Solutions

SWR views technology and data as enablers; tools to help Waterloo Region improve child and youth well-being. There has been a concerted effort to ensure that solutions are deployed where they will best help overcome a problem or increase the impact of service and supports to children and youth.

Technology- and data-enabled solutions are only one component of a human-centred approach. And while SWR looks to integrate and leverage these solutions where possible, it is equally important to build the appropriate protocols and relationships to support delivery, safety and privacy for individuals and families.

4.1. Policies

The best available evidence will inform the purposes for which data are used, and inform the conclusions drawn from any insights gained through data analysis and mining. As such, any technology and data-enabled projects planned for SWR are shaped by this principle and the need for SWR to determine program/project success and impact against outcomes.

SWR will develop policies and standards for interoperability and future-proofing that will apply to any technology and data-related project. These policies and standards will be included in the development of RFPs and the evaluation of partnerships, products and services.

4.1.1. Replicability & Scalability

SWR is committed to scaling technology- and data-enabled solutions, as well as the SWR measurement and engagement approaches, with other communities across Canada. Through implementation, SWR will take a three-level scaling approach:

1. Scaling solutions to reach urban and rural children and youth across Waterloo Region
 - a. Solutions developed and implemented with school boards will first be scaled across Waterloo Region schools, as identified by local school boards
2. Scaling solutions to communities across Ontario
3. Scaling solutions with other communities across Canada

This approach to scaling or transferring solutions allows SWR and partner communities across Ontario and Canada to consider localized factors such as: geography, culturally diverse populations, socio-economic factors and the capacity of service-delivery organizations.

SWR will use a knowledge-sharing platform to share evidence, approaches to performance measurement and engagement, and solution identification and development with partners across Canada. Communities, governments and organizations will be able to use the platform to inform and encourage the adoption and adaptation of programs to other communities. Specifically, SWR will scale and share:

- Technology- and data-enabled solutions
- Lessons learned and best practices
- Research on child and youth well-being, including data sharing, security, management and privacy
- Information on open architecture and open coding

4.1.2. Interoperability and Future-Proofing

Interoperability will be a central tenet in the implementation phase. SWR will establish a standardized application programming interface (API) for inputting data into the SWR Data Collaborative (described below), which will allow for the development of new standards for data on child and youth well-being. This allows data to be the connective tissue

across all technology- and data-enabled solutions and does not lock vendors into using specific development platforms or languages.

APIs will allow organizations to build technology solutions on platforms or apps that best meets the need of the end user and will allow them to create the highest quality experience possible. Doing so will improve the uptake and acceptance of the technology and increase the chances solutions will be successful in delivering greater insights. This makes it easier for data analysts to quickly work with the information as there is less time required to clean and normalize the data. In addition, the standards developed can be rolled out to other communities, multiplying the benefits of interoperability by allowing easier analysis across multiple jurisdictions.

Communities and vendors that create apps or programs with the intent to use the SWR Data Collaborative will be expected to use and adhere to the standardized API approach. Clear rules around use and licensing agreements will be put in place to provide the necessary legal framework. Standards around data collection will be codified and will inform how the data architecture is built so it can scale and be easily replicated in other jurisdictions. Use of open architecture and software will be encouraged to ensure solutions can be easily adapted and made accessible to other user groups. During the implementation phase, SWR will determine the best approach to developing the SWR Data Collaborative platform based on this criteria including whether to build a new platform or purchase an existing platform and customize it for SWR purposes.

Other standards affecting interoperability and scalability include:

- Data collected from the application of technology, the sharing of data through the SWR Data Collaborative, and the assessment of data will be used to inform future technology- and data-enabled solutions, and pilot projects
- Identification of trends, impacts, and progress towards targets based on data will be used to inform community partners, and to help develop criteria and the framework for development
- Open-source software will be used where possible and will allow for maximum flexibility when customizing solutions to the needs of other communities (see Vendor Responsibilities below)

4.1.3. Usability, Accessibility & Diversity

Through Phase 2, SWR identified a number of diverse child and youth populations in Waterloo Region, including but not limited to: rural; newcomer; Indigenous; children and youth with special needs; and children and youth identifying as LGBTQ2+. While the technology- and data-enabled solutions described are intended to benefit all children and youth, specific programming is targeted at notably marginalized or underrepresented children and youth. Moving forward, in selecting solutions and through the RFP process, SWR will develop criteria that favours solutions that are accessible to diverse populations (e.g., translation, transportation barriers, cultural diversity, disability).

4.2. Vendor Roles & Responsibilities

As a condition of funding, successful vendors will be expected to comply with relevant privacy legislation and the privacy and data principles developed by SWR. Standards for safeguards to protect data will be required from each vendor prior to the piloting or implementation of any solution. Vendors and researchers will also be subject to SWR Intellectual Property (IP) principles for any new technologies developed through the customization process or development process.

To support the continuous advancement of technology- and data-enabled solutions to improve child and youth well-being in Waterloo Region and across Canada, criteria will include factors relating to:

- **Open Framework:** the part or parts of the framework developed for SWR can be separated and shared as open source to developers, other communities and organizations building solutions for children and youth.

- **Open Tools and Open Product:** identification of any open-source tools that could be adopted for other solutions and what permissions are available for the customization of technology and data-enabled solutions.
- **Restrictive but Open:** For vendors with licensed or proprietary code, vendors must be able to identify how SWR (or other communities) may gain access to full code after purchasing a vendor license.

For additional information regarding compliance, legislative and regulatory issues, please see Chapter 5.

4.2.1. Smart Waterloo Region Data Collaborative

At the centre of SWR is the SWR Data Collaborative. It will be a regionally-based collaborative dedicated to building a well-managed data system that overcomes the limitations of siloed data systems and resolves privacy and trust issues in sharing data. It will aggregate data on children and youth from a variety of regional, provincial and national sources, as well as local organizations serving children and youth and their families, to provide a comprehensive understanding of factors contributing the well-being of children and youth. Combining this community data into one platform, the SWR Data Collaborative will allow our community to track and monitor the well-being of children and youth, and will enable data-informed decision making and problem solving.

The SWR Data Collaborative will allow users to store, share and analyze data using statistical tools, artificial intelligence (AI) and machine learning (ML), in a secure platform, accounting for all privacy and security considerations through effective governance and safeguards.

Through the development of the SWR Data Collaborative, SWR will work with partners to develop policies, procedures and protocols that outline appropriate levels of authorized access to the data and information being included.

4.3. Smart Waterloo Region Technology- and Data-Enabled Solutions

SWR will improve the well-being of children and youth in Waterloo Region by leveraging the benefits of data and connected technology. That is, improved understanding of what children and youth need and how to help them thrive now and in the future.

4.3.1. Selection of Projects

Technology- and data-enabled solutions were prioritized based on the following:

- Needs/themes that were heard via multiple engagement channels (e.g., Stakeholder Labs, Youth Advisory-led Street Teams, Hackathon, etc.)
- Evidence that the solution would impact child and youth well-being
- Connection to prioritized root cause(s)
- Connection to areas of focus
- Upstream/preventative in nature
- Opportunity to scale, via data/technology to achieve a broader impact in the province or across the country
- A reasonable and helpful role for data and/or technology in addressing well-being problems (i.e. solutions driven by problems, not by technology)

Technology- and Data-Enabled Solutions

"We believe that smart demand, supply and use of data drives better results for children. When the right data are in the right hands at the right time, decisions can be better informed, more equitable, and more likely to protect children's rights. Effective use of data can help us not just track results for children, but also shape those results with better insights about what's working, what's not, which children are thriving and which are being left behind." UNICEF, 2017

The table titled Technology- & Data-Enabled Solutions (below) summarizes the proposed solutions that will help SWR and community partners respond to the needs identified by stakeholders in the Phase 2 engagement process (see Chapter 3).

4.4. Child and Youth Well-being Dashboard

In partnership with UNICEF Canada, SWR will build Canada's first real-time Child and Youth Well-being Dashboard (the Dashboard). The Dashboard will allow SWR to ensure accessible, interoperable and open data approaches while maintaining the privacy of personal information, personal health information and confidential information in its custody and control.

The Dashboard will provide visual output for the information collated by the SWR Data Collaborative. The Dashboard will be the place for Waterloo Region families, child and youth service providers, educators, researchers and policy makers to learn more about how children and youth in Waterloo Region are faring using the CY-Index as a framework. It will be based on an open-by-design approach and will provide data to the different audiences in accordance with relevant legislation. These insights can help the community collectively lead change to create better outcomes and a better community.

As a central source for tracking the indicators required for the CY-Index, the Dashboard will help SWR benchmark Waterloo Region now and on an ongoing basis. By tracking indicators, the community can celebrate successes as well as inspire individuals and groups throughout the community to take action where it is needed most.

Once the Dashboard has been developed and tested, it can be rolled out to other Canadian communities. SWR will ensure open-source coding is used in development and provided to other communities wishing to adapt the Dashboard for their own use.

4.4.1. SWR Data Collaborative Pilot

Understanding the Data Collaborative platform exists in other jurisdictions (e.g., Silicon Valley Data Trust), SWR decided to pilot the platform during Phase 2. SWR piloted the SWR Data Collaborative to demonstrate:

- The benefit of multiple organizations working collectively to break down silos and set a strong foundation for good data governance
- The successful development of relevant data privacy and security requirements for data sets from a multitude of sources and with a variety of privacy requirements
- That new, actionable insights related to the well-being of children and youth can be gained when data is shared among partners
- The benefits of applying AI and ML to data analysis
- That new insights allow for a shared understanding of well-being of children and youth in the community, better decision-making and a platform for coordinated service delivery

Early childhood development is one area of focus for SWR and a measure found in the CY-Index. With this in mind, and in the interest of keeping the pilot manageable, early childhood development was selected as a focus for the SWR Data Collaborative pilot. Specifically, vulnerability to difficulties learning for Senior Kindergarten (SK) children as measured by the Early Development Instrument (EDI).

Leveraging Existing Research

There are several factors influencing early childhood development outcomes. The Phase 2 Data Security and Privacy Committee (DSPC) selected key data points from a number of sources for inclusion in the pilot in order to explore relationships and the magnitude of factors influencing outcomes in the local child population. These sources included:

- Early Development Instrument (2010 and 2015)

- Kindergarten Parent Survey (2015)
- Healthy Babies, Healthy Children (2014-2018)
- Region of Waterloo licensed child care spaces and locations (2015)
- Canadian Census (2016)

Analysis & Tools

With the support of the Phase 2 DSPC, SWR used a variety of statistical software packages and methods to analyze the data, including geospatial analysis, descriptive statistics and correlations. SWR partnered with Communitech and Terrene Technology Inc. (an AI and ML company based in Waterloo Region), to explore and analyze the data. A random forest model was trained to calculate the importance of each variable in predicting early childhood development outcomes in relation to the other variables available in the SWR Data Collaborative. The importance of each variable is measured by calculating the increase in the model's prediction error after permuting the variable.

Insight

The analysis helped SWR understand the complexity of variables underlying well-being and early childhood development. For instance, there was a strong correlation ($r^2=0.6$) between the percentage of children who scored low on one or more domains of the EDI (EDI, 2015) and the percentage of families who indicated they have no disposable income (KPS, 2015). Geographically, this relationship manifests in a trend where the areas with the highest proportions of children vulnerable to learning difficulties also tend to be areas with the highest proportions of families without disposable income. Areas with the lowest proportions for both factors tend to also coincide. Similar findings for the correlations between children vulnerable to learning and the income variables from the 2016 Census (Low-Income Cut Offs and Median After-Tax Income) appeared to validate this trend. Low-income status and lack of disposable income were also strongly correlated with several other factors related to child well-being.

Analysis also determined the relative importance of variables to an independent variable (i.e. the percentage of children scoring low on the EDI). The model found parents' level of education – particularly completion of high school – is important in predicting the percentage of children scoring low on the EDI.

Outcomes & Next Steps

When SWR expressed intention to undertake this pilot, many organizations thought it would not be possible. SWR made it possible. The pilot proves that working in collaboration and the collection, use and analysis of data from different sources to access localized insights about child and youth well-being is not only possible, but fruitful. As a result of the pilot, SWR has committed to scaling the SWR Data Collaborative and the Dashboard. In addition, SWR has confirmation of the validity of scaling the SWR Data Collaborative and the Dashboard in implementation.

The findings from these exploratory analyses were intended as a demonstration of the power of collaborative data analysis. However, the results certainly suggest localized issues related to inequality and early childhood development where potential community action might be warranted. More rigorous research and exploration are recommended. In order to conduct more rigorous exploration, SWR will work with data owners to access, share and analyze data with more granularity.

As a result of the pilot, the Phase 2 DSPC has made adjustments to the SWR Data and Privacy Principles to ensure any AI or ML algorithms are explainable. That is, recommended action can be a) trusted and b) easily understood by humans. Further, the pilot validated the importance of being research-focused, having experience and expertise, and having people who understand and can interpret the context of the datasets and outcomes.

Limitations

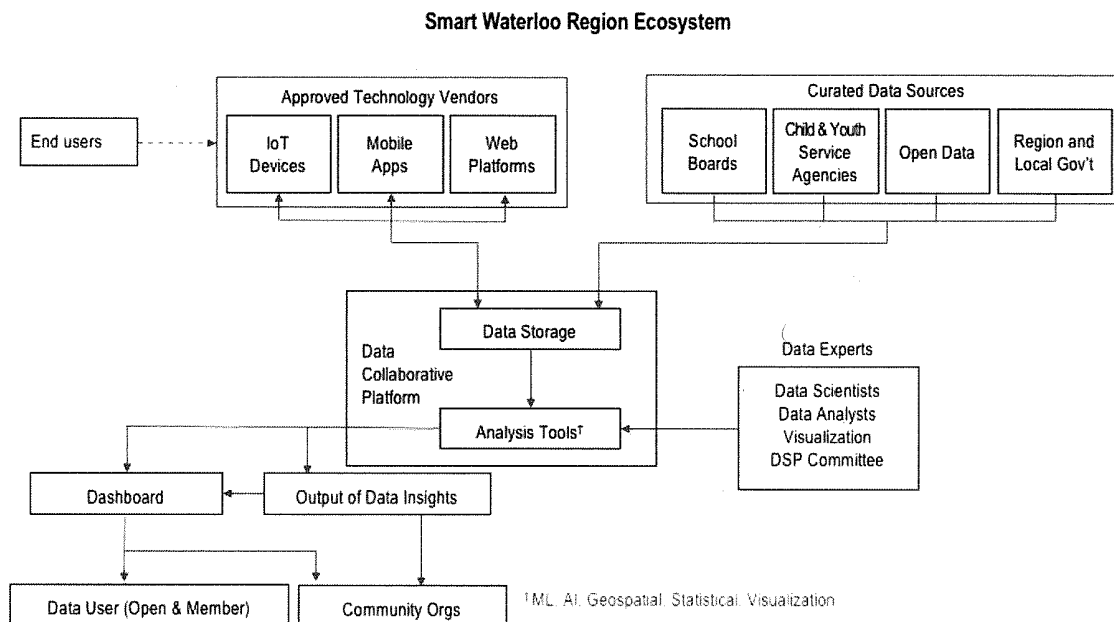
Data was piloted at the aggregate dissemination area (ADA). As such, caution should be taken about relationships between variables at an individual level. Furthermore, only five data sets were included in the pilot, while there are countless factors that are known to influence early childhood development.

Calculating importance for a target variable when other variables in the data strongly correlate may result in the final calculated importance being "split." This means the machine learning model places less importance on each individual variable. Results for this kind of analysis would be more accurate with a deeper version of this dataset with aggregate, more granular information from a greater number of regions. This would allow – with a high degree of confidence - the identification of the variables that are a root cause from those that are merely a side effect.

4.4.2. SWR Data Collaborative: Security and Privacy Specifications

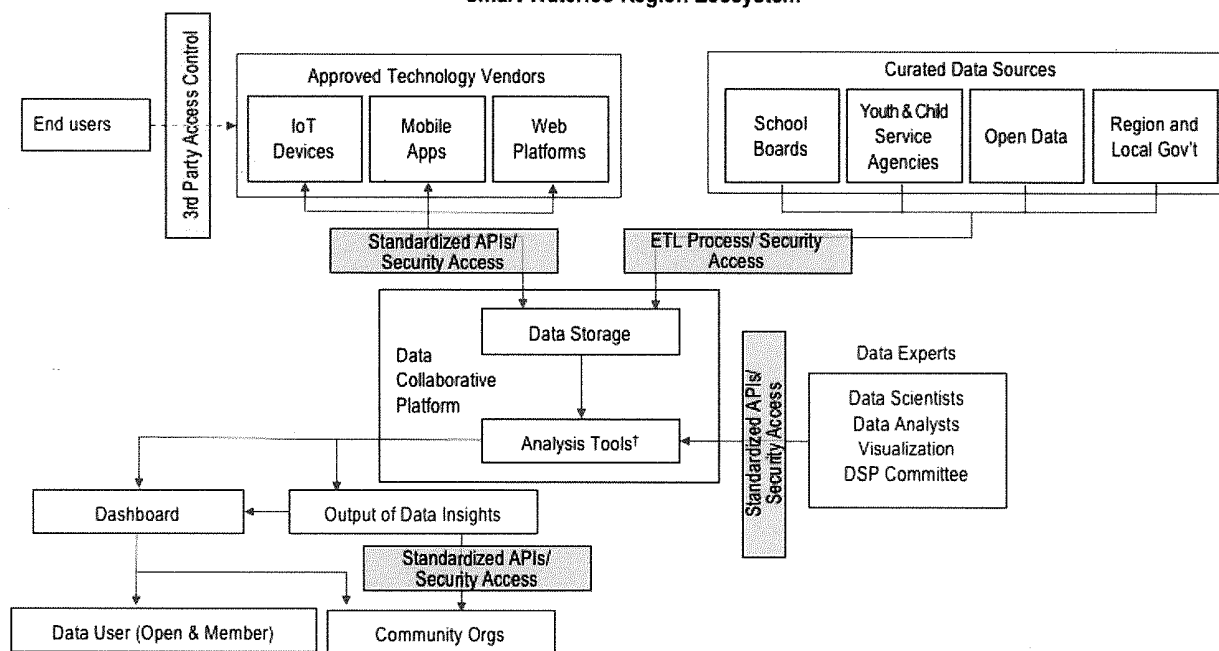
The platform for the SWR Data Collaborative will be designed to provide authorized users the ability to access and contribute insights, learn from available data and make decisions that address the complex issue of child and youth well-being. Over time the platform will expand to include a multitude of data sources to help users better define relevant gaps, needs and challenges generally and regionally, and see relationships and trends like never before. The data will also be used to track progress of child and youth well-being over time. The technical specifications of the SWR Data Collaborative are outlined in the table titled Data Collaborative Security & Privacy Specifications below.

The platform will function as the heart of the SWR data ecosystem, a dynamic entity that connects data creators and data users. It will intentionally build data capacity in Waterloo Region and beyond. The diagram below describes the data flows, types, creators and users SWR anticipates will be part of the ecosystem.



The data ecosystem data flow controls, data governance and potential breach points of risk are outlined in the diagram below.

Smart Waterloo Region Ecosystem



4.4.3. Data Collaborative Security & Privacy Specifications

Element	Description	Notes/ considerations/ options
Centralized data platform	Data analysis and management software is stored and accessed on a centralized server. Ability to audit server provider security. Provider privacy breach notification procedure in place.	Server provider TBD. <ul style="list-style-type: none"> ISO 270001 certified Cloud provider. Housed locally by the Region of Waterloo (or through a vendor selected through a RFP process) Many current partners are connected through WREPNet fibre network, a secure network option that can operate outside public Internet.
User Interface	Authorized users access the platform through encrypted user interface such as: SSL Web Interface, Virtual Desktop Infrastructure (VDI).	
Administrator(s)	Administrator access granted to someone / people who will have access to the platform directly to administer the data platform. Administrator(s) will be responsible for administering the platform, including: <ul style="list-style-type: none"> Granting authorized user access. Troubleshooting. Liaising with developers as needed. Loading data as per the defined security, privacy and licensing restrictions related to the data set. Auditing use of data to ensure licensing compliance and privacy controls. 	
Data is secure (technical)	All platform access is encrypted with current high security ciphers. Access by users with two factor authentication (password and secondary token). Information exchanged with user interface is encrypted in transit. Data in the platform server encrypted at rest. Software will have ability to track and audit and report user access and use of the platform and specific data sets.	SSL. VPN (using a password and secondary token to authenticate users to access platform).
Data is secure (physical)	Physical safeguards are in place to protect data platform. This may include:	Data centre best practices employed to secure data and platform.

Element	Description	Notes/ considerations/ options
	<ul style="list-style-type: none"> 24/7 security staff. Security card access/biometric authentication. Video surveillance system. Mantraps for authorized person verification. Intruder and door tampering alarms. Secure managed loading dock. Locked racks and cabinets. Backups and backup power systems. 	<p>The extent of the physical security should be based on the location and risks present:</p> <ul style="list-style-type: none"> Shared data centre: all aspects needed. Secure facility hosted locally by a partner: not all aspects are likely to be present.
Data is secure (administrative)	<p>Administration policies and procedures to grant authorization to appropriate authorized users only.</p> <p>Each data set loaded has clearly defined licensing and use restrictions included as metadata. The data platform would ideally prevent (or warn) of any use that may contravene the allowable use of the data (e.g. will not report data sets of less than the allowable sample size).</p> <p>Use and access to data sets is tracked and audited regularly to prevent and detect breaches.</p> <p>Tracked data about use will be stored/retained for future use if needed.</p> <p>Authorized users will agree to terms of use and privacy policies (through Legal Agreement/Contract).</p>	<p>Ability for Administrator to create and run audit reports.</p> <p>Authorized users will also need to indicate agreement to terms of use at each log-on.</p>
Data is safe from disaster	<p>Data is backed up daily to a separate server at a separate location (meets the same criteria, including encryption in transit and at rest).</p> <p>Disaster recovery space.</p>	
Data analysis tools available on platform server and VDI	<p>Statistical analysis, visualization, geospatial processing tools as well as AI and ML</p>	<p>Explore predictive analytics and/or ML tools</p>
Authorized user access	<p>Users will log on to the platform using a two factor authentication process.</p> <ul style="list-style-type: none"> User passwords reset every 45 days. Enforcement of minimum password rules such as 10 characters in length, etc. Password locks after three attempts. 	<p>Access through a software program that allows users to log-in and securely and privately access the platform environment.</p>

Element	Description	Notes/ considerations/ options
	<ul style="list-style-type: none"> Password recovery through email. 	
Levels of access	Administrator can assign unique user IDs Users will have different access rights/levels including what data sets each user can access.	
Automatic and manual retention and destruction	Data platform will have the ability to apply retention schedules to data sets to comply with legislation and agreements with data owners. Destruction can also be done manually by the administrator. Ability for data to be permanently deleted.	Will need to determine how to permanently delete data in backups/replicated versions of system (from Disaster Recovery / Business Continuity perspective).
Communication	Ability for authorized users to communicate and share analyses securely within the data platform environment.	
Reporting function	Ability to export aggregated analysis through secure API.	No record level data will ever be reported. Suppression levels will be honoured to protect privacy.

4.4.4. Technology- and Data-Enabled Solution Projects

The technology- and data-enabled solutions described below are organized by the areas of focus and root causes, with distinct focus on solutions that enable data, research and knowledge across the community and organizations. While many solutions will bring multiple benefits to children, youth and families, the solutions have been grouped according to the area of focus believed to be most directly impacted by each particular effort. While solutions have been generated to add value to the children, youth and caring adults in the community at large, those believed to be particularly impactful to rural and Indigenous communities have been highlighted to indicate special focus on diverse populations. Requests for Proposal processes will occur for any project where the technology vendor and/or community service delivery partner has not yet been identified.

D = Data	E = Early Childhood Development	M = Mental / Emotional Health	S = Sense of Belonging	R = Root Causes
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No.	Project Title	Description	Rationale	Implementation/Scaling
D1	Centre of Excellence for Child and Youth Well-being.	Waterloo Region will create a Centre of Excellence (COE) for child and youth well-being in partnership with local post-secondary institutions,	The COE will act as a knowledge centre and living lab. It will support community partners and other communities across Canada with	The COE will be housed in a new multi-use development made possible by a public-private partnership with HIP Developments

No.	Project Title	Description	Rationale	Implementation/Scaling
	Status: NEW	UNICEF Canada, CYPT, the technology sector, provincial and municipal governments, and others. The COE will be a space to focus on data, research, programming and knowledge mobilization related to child and youth well-being.	access to child and youth well-being data, strategies and technology.	and LAUNCH (an initiative to offer STEAM programming to children and youth)
D2	SWR Data Collaborative & Child and Youth Well-being Dashboard. See detailed description above. Status: NEW			
D3	Indigenous Child and Youth Data Strategy. Status: NEW	In partnership with local Indigenous stakeholders, SWR will develop an Indigenous Data Strategy that supports Indigenous child, youth and family well-being	Indigenous community members have identified the need for better data on Indigenous children and youth, and more information about their needs.	SWR will help explore and build an Indigenous Data Strategy that will accurately identify the state of well-being for Indigenous children and youth.
D4	Community Child and Youth Well-being Survey. Status: PILOT	In partnership with the Ontario Trillium Foundation, UNICEF Canada, the Canadian Index of Wellbeing, CYPT and youth, SWR will develop and pilot a community child and youth well-being survey aligned with the CY-Index. The survey will collect data and report on how children and youth are faring through a standardized tool.	The CY-Index has identified key indicators of child and youth well-being, however the availability and validity of some of this data varies across communities. This project will develop a standardized measurement methodology and technology tools to collect data.	The digitized survey tool will be developed, piloted and implemented in Waterloo Region. SWR and partners will develop a knowledge mobilization plan to scale the tools and approaches to data collection to other communities across Canada.
D5	Data Collection and Analysis in Schools. Status: PILOT (YDI) SCALE (MDI)	SWR will support WRDSB in refining and scaling use of the Middle Years Development Instrument (MDI) across Waterloo Region. SWR will support the development and pilot of a new tool - the Youth Development Instrument (YDI) - in collaboration	There is currently a gap in high-quality, system-level data for children and youth in the middle and adolescent years. Data from these tools will provide student well-being data that will better inform planning and school environments.	Assist in administration of the MDI every 2 years, and subsequent data analysis. Develop, pilot and fully implement YDI in WRDSB schools.

No.	Project Title	Description	Rationale	Implementation/Scaling
		with University of British Columbia (UBC).		
E1	CoHealth. Status: NEW	In partnership with the Waterloo Wellington Local Health Integration Network (WWLHIN) and First 2,000 Days, SWR will launch and scale CoHealth. CoHealth is a personal mobile health manager app, designed to digitize the discharge process following childbirth and improve parents' ability to care for themselves and their new baby. CoHealth also provides supports and key information over the first 5 years of a child's life.	Traditionally, parents are provided with a large amount of information following the birth of a child. This can be overwhelming and confusing. By making information timely, and easier to receive, it will increase opportunities to meet important child-health milestones and reduce missed information.	Upon discharge from hospitals parents will receive CoHealth to access supports. SWR, WWLHIN and First 2,000 Days to create awareness of CoHealth among service providers working with new parents. CoHealth will connect to Family Compass (R1) for system level information integration. Incorporation of literacy stamps for physicians using an Electronic Medical Record System. Other LHINs could scale CoHealth across Ontario.
E2	Online Prenatal and Parenting Programming. Status: NEW Special Focus: Rural	SWR will work with Region of Waterloo Public Health and organizations supporting parents to create a prenatal program app built and adapted from Public Health's online prenatal program. This project will also digitize existing parenting courses.	The prenatal program app and enhanced online parenting course offerings will provide new parents greater access to critical knowledge and skills.	SWR will work with Public Health and other organizations supporting parents to promote the app and online course offerings. SWR will support the digitization of parenting courses and skills acquisition. The approach and results will be shared through the Ontario Family Health Managers network.
E3	Digital Early Learning Portfolio. Status: PILOT	SWR and Conestoga College will create and pilot a digital child portfolio template. This portfolio will capture an individual child's learning and development through licensed early learning and child care environments. The portfolio will	The digitized portfolio will allow for consistent and fulsome information to be captured per child, acting as a resource for parents and future educators. The portfolio will transition with the child into school - creating a profile of the child's	Develop the portfolio with multiple stakeholders (early years sector, technology sector, etc.) and user groups Pilot and field test within the lab school environments for security, usability and effectiveness

No.	Project Title	Description	Rationale	Implementation/Scaling
		ensure easy data collection and access, security and privacy, and data analysis (including AI).	strengths and learnings for educators and parents.	
E4	Kindergarten Self-Regulation and Foundational Early Learning Skills. Status: SCALE	This project is a continuation of a WRDSB initiative that works to build a systematic, intense focus on the development of critical, interrelated skills (self-regulation, oral language, and literacy/numeracy development) in kindergarten The WRDSB Research Department is active in measuring the effectiveness of this intervention.	The program will reduce achievement gaps and developmental lags. Students at risk will be identified early, and participate in targeted, differentiated interventions. Provides data literacy support for educators. Enables the creation of specific student strategies.	Improved skills are measured by automated pre- and post-test tools including the Kindergarten Self-Regulation tool, Reading Records, and oral language screener. Schools (10-12/year) will be chosen from a variety of demographics within Waterloo Region.
L1	Tablets for Family Literacy. Status: PILOT	In partnership with Project Read, SWR will pilot a family tablet project for family literacy skill development in families living in lower socio-economic conditions.	Deploying tablets to families in need who are participating in family literacy programs will improve access to resources and training materials and strengthen skill acquisition.	Deploy 30 tablets to families participating in the Family Literacy Program. Tablets will be equipped with evidence-based family literacy software to support the Family Literacy Program.
M1	Social- Emotional Learning in Schools. Status: SCALE	Scale current school board pilots that build social-emotional skills (e.g., hope, optimism, resilience) of teaching staff and students. This project uses robust data and measurements, and online supports, to build these social-emotional traits that predict health, happiness, and success throughout school and life.	Social-emotional skills are foundational to mental/emotional health. Children, youth and adults with greater social-emotional skills have greater resiliency in navigating life challenges and are more likely to experience success in school (as well as life in general).	Support Social-Emotional Learning pilots in current boards and scale to new schools based on school communities that demonstrate greater needs in the social-emotional space. Fully implement over the next 5 years. Collect meaningful data and insights to measure and report on success, while informing ongoing program iteration.
M2	Social- Emotional Learning for Caring Adults.	Focus on social-emotional skill development (e.g., hope, optimism, resilience) for caring adults (e.g., parents, coaches, etc.) with a	When caring adults create a culture and model social-emotional skills, it reinforces their importance in children's lives and further supports	Digital assessments of caring adults to create baseline and inform macro state of adult social-emotional fluency and inform training

No.	Project Title	Description	Rationale	Implementation/Scaling
	Status: NEW	technology and data-enabled approach. Digital assessment of social-emotional skill and knowledge, in-person and online training, and community supports.	this skill acquisition and fosters a community culture of well-being.	development. Offer in-person, web, mobile and location-based training. Collect meaningful data and insights to measure and report on success, while informing ongoing program iteration.
M3	Virtual Counseling. Status: PILOT Special Focus: Rural	To increase access points to mental health supports for children, youth and families. SWR will partner with the WWLHIN and the Rural Child and Youth Wellbeing (RCYW) initiative to pilot the offering of virtual counseling using telemedicine technology.	Remove the need to attend mental health appointments in person. Allow more individuals to participate in counselling services regularly and consistently.	Pilot in rural townships where there may be more limited access to mental health supports, and then scale up to more locations where appropriate.
M4	Youth Mental Health Services App. Status: NEW	In partnership with community mental health service providers, develop a one-stop app where youth can confidentially access mental health information, resources and support services. Incorporate a social platform where children and youth can seek services and engage with each other.	Phase 2 feedback from youth indicated mental/emotional health supports – in the right format, place and time – are lacking and that current resources are challenging to navigate while online.	Create a responsive, integrated, interactive mental health app with accurate system level information, to provide confidential supports to youth. Include Chatbot preliminary assessment function, appointment booking capability, online community, connection to the Family Compass platform (R1).
M5	Incentivizing Health Activities App. Status: PILOT	In partnership with the UW Games Institute and other partners, develop and pilot an app to incentivize children and youth to proactively undertake activities to maintain or enhance their mental or physical health.	Incorporate gamification techniques to make physical and mental health activities more engaging, rewarding, and interactive for children and youth.	Work with the Games Institute and other community partners to develop and test the app. Explore features that allow children and youth to set up clubs or networks to participate in virtual youth-led group/team activities.
S1	Connected Community Spaces.	Through a partnership with Rogers Communications and local area municipalities, build high-speed	Youth and caring adults with devices may not have access to cellular data and rely on free Wi-Fi, to get	Connected Community Spaces will provide ubiquitous fibre to township libraries and community centres,

No.	Project Title	Description	Rationale	Implementation/Scaling
	<p>Status: PILOT</p> <p>Special Focus: Rural, Indigenous</p>	<p>internet to support program and service delivery in townships. Connected Community Spaces also include the COE (D1) and the local Indigenous EarlyON, designed to support Indigenous children, youth, and parents with programming and service supports.</p>	<p>connected where available. Many township families do not have access to high-speed Internet outside of school. Only 3 of 11 township libraries have fibre. They are not able to leverage technology and data to the full extent possible to support learning and development.</p>	<p>expand the hotspot borrowing program across Waterloo Region libraries and community centres, and be a conduit for program delivery. This project will include implementation of a single WiFi Service Set Identifier (SSID) and pilot 5G technology across Waterloo Region and consider an open-source model to improve scalability. Support technology programming customized to Indigenous needs in Waterloo Region, and e-platform supports.</p>
S2	<p>Connected Outdoor Spaces.</p> <p>Status: PILOT</p> <p>Special Focus: Indigenous</p>	<p>Pilot the use of technology to make it easier to connect to and enhance experiences at outdoor and recreation spaces. Including sensor technology at outdoor spaces, app-based supports to encourage physical fitness, mapping features and information about coordinated outdoor activities run by organizations and municipalities. Partner with Indigenous groups to create digitized historical information areas at meaningful outdoor sites and link to current Indigenous programming and services for families. Undertake a research project with the UW that uses an evidence-based app to measure the impact of the</p>	<p>Make it easy for children, youth and families to connect to outdoor spaces, activities and physical and mental health benefits. Celebrate and recognize local Indigenous history and culture, and encourage Indigenous youth to explore and create digital content.</p>	<p>Pilot in 10 different outdoor spaces across the Region. Make information on available outdoor spaces (e.g., parks, schools, trails) digitally available, in real-time. Allow youth and families to book outdoor spaces through a connected platform for recreational activities. Incorporate sensor technology to help keep spaces safe and monitor usage. Encourage apps to support physical fitness and activities. Create connected app that people can follow along with information on Indigenous history and to access information and resources.</p>

No.	Project Title	Description	Rationale	Implementation/Scaling
		physical outdoor environment on child and youth well-being.		
S3	Engaging and Innovative Learning Environments (Third Teacher). Status: SCALE	Support WCSDB efforts to incorporate digital technology, kinesthetic outlets and innovative classroom equipment to support higher levels of student engagement and the development of important technology skills. The tools and technologies, as well as classroom design elements can be enhanced by our community partners and will feed forward to post-secondary partners who also wish to see this type of learning environment fostered.	Well-being of children and youth in a learning environment is enhanced by both higher levels of engagement as well as the resources available within the classroom setting. Various modalities of learning are supported when students are able to be up and moving in their learning environments.	Leverage technology as a positive learning tool with innovation supports to learning environments (e.g. classrooms, libraries), including Chromebooks, technology equipment (e.g. 3D Printers) and maker spaces. Incorporate stationary bikes and modular equipment into learning environments. Scale Third Teacher Design Principles to 9 schools per year, over 5 years. The 15 high social-risk index schools will be prioritized.
S4	Digital Citizenship Strategy. Status: PILOT Special Focus: Rural (Low German Mennonite)	SWR, UW, Communitech and other community partners will develop a digital citizenship strategy for children, youth and caring adults. This strategy will help our community to better understand and navigate new social complexities that increased interaction with technology, and in online spaces, introduces. With the RCYW initiative, SWR will develop and pilot customized programming for LGM population on internet safety.	Increased understanding of the impact of interaction with and via technology, to support awareness of how technology may support or hinder development and well-being. Waterloo Region's rural LGM community does not typically engage with technology though some use apps on mobile devices. Increase awareness of digital safety and other issues.	The strategy will focus on how to best interact with technology, how to conduct oneself in an online environment and appropriate exposure to technology. Tools and resources will be developed and shared with youth and families through existing partnerships with service providers. SWR will work closely with the RCYW initiative to develop and share specific tools and resources for the LGM population.
S5	Meaningful Volunteering Platform (VolunteerAttract).	The Volunteer Action Centre (VAC) is a network of nearly 200 community and neighbourhood organizations supporting volunteer	Phase 2 found one of the biggest drivers of volunteering is the opportunity for youth to make meaningful change. But youth	SWR will support scaling of VolunteerAttract in Waterloo Region. Working with VAC, Volunteer Canada and youth, further work will

No.	Project Title	Description	Rationale	Implementation/Scaling
	Status: SCALE	needs. In partnership with the University of Waterloo, VAC developed a cloud-based interactive database of volunteer positions for Waterloo Region called VolunteerAttract. This project would scale VolunteerAttract to help youth find volunteer opportunities in Ontario, across Canada and with the Canada Service Corps.	volunteering rates are on the decline. VolunteerAttract will connect youth to more meaningful volunteer opportunities, and hope to increase volunteerism.	align volunteer opportunities with the UN's SDGs, and develop gamification-based volunteer matching technology. VolunteerAttract will be scaled nationally. Volunteer Canada will provide mentorship and training to all volunteer centres that choose to adopt the new approach.
S6	E-Mentorship Matching. Status: PILOT	SWR will work with partners like Big Brothers, Big Sisters of Waterloo Region to encourage corporate support of mentoring for children and youth in Waterloo Region, including the development of a pilot e-mentoring platform.	E-mentoring supports connecting caring adults to children and youth, increasing the positive impacts of mentorship and helping children and youth build life skills. E-Mentoring will help overcome distance and isolation.	The platform will include a mentoring matching function and enable mentors to communicate with their mentee in an interactive manner. E-mentoring would develop a safe and structured relationship via the platform.
S7	Strengthening Newcomer Pathways. Status: PILOT	In partnership with the YMCA of Cambridge, Kitchener-Waterloo (YMCA CKW), SWR will help to build a new e-platform (including mobile compatible app and chat features) for the Newcomer Youth Program to reach more newcomer youth and connect them to available service providers, programs and community activities in Waterloo Region.	The YMCA Newcomer Youth program provides youth with knowledge and tools to help them integrate into Canadian society, alleviate fear and loneliness, and develop an authentic sense of belonging. The platform and apps will help more newcomer youth experience the benefits of this program.	The new e-platform will use drip messaging to guide youth to local supports and opportunities based on date of arrival. The platform will collect data to inform program delivery services that can be scaled. The platform will be scaled across Canada, with support from the YMCAs of Vancouver, Edmonton, Calgary, and Quebec (Montreal & Quebec City).
S8	Welcoming Newcomer Families to Licensed Child Care.	SWR and Conestoga College will pilot engaging technology and innovative apps to support the expansion of an early-learning program that integrates healthy child	The incorporation of technology will increase supports for newcomer families and children in licensed early learning and child care settings. The increased connection	Development of technology- enabled supports to capture and co-author family experiences.

No.	Project Title	Description	Rationale	Implementation/Scaling
	Status: PILOT	development with English language learning; and expand educators' understanding of the varied life experiences of newcomer Canadians.	to the program will reap greater early learning and developmental outcomes.	Creation of a virtual Human Library of newcomer experiences, shared across the community. Opportunities to expand to other licensed child care programs in Waterloo Region will be explored upon evaluation of the pilot.
S9	Re-Engagement of Students. Status: SCALE	Work with local school boards to support re-engagement of youth who have left the school system, or are at risk of leaving the school system.	The goal is to set children and youth on a positive trajectory to academic engagement and/or to facilitate the earning of credits toward graduation. Innovative and relationship-based interventions have demonstrated success with re-engaging students and reconnecting them on a path to graduation.	SWR and school boards will leverage technology platforms to support re-engagement efforts. Predictive analytics will be used to facilitate the development of early intervention strategies to support increased graduation rates.
S10	Indigenous Child and Youth Leadership Program. Status: SCALE Special Focus: Indigenous	WRDSB's Indigenous Children and Youth Leadership Program (land-based learning) is an effort to engage Indigenous students from kindergarten to grade 12 in memorable, meaningful and transformative outdoor learning experiences that encompass Indigenous perspectives, values and practices.	By engaging Indigenous students in critical thought through interaction with the land and understanding of nature and its relation to science, we anticipate an increase in Indigenous student success in education.	Development of digital resources. Technology-enabled professional development strategies (e.g. e-learning modules). Development of an online tool for shared learning.
R1	Family Compass Platform. Status: SCALE Special Focus: Rural	Family Compass (FamilyCompassWR.ca) is an existing platform created by CYPT, Special Needs Strategy Planning Table of Waterloo Region (SNS) and Moving on Mental Health. The platform provides a single online starting point to make it easier for	Family Compass was originally developed in response to feedback from families that the system of supports for children and youth was difficult to navigate. Family Compass has served as a helpful system access and navigation resource, and	Evolve Family Compass and include mobile compatible applications and connected resources (i.e., OneList, etc.) Leverage AI to help users navigate, book and register for available services and programs.

No.	Project Title	Description	Rationale	Implementation/Scaling
		<p>families and youth to navigate services and find help, particularly for families of children with developmental concerns. SWR will help evolve the Family Compass to make improvements to the platform itself, as well as connect other applications:</p> <ul style="list-style-type: none"> - OneList - parents receive information, apply for licensed early learning and child care and help manage schedules. Parenting Now - parents connect with and learn from other parents, acquire parenting skills and information. Recreation Fee Assist - parents and youth find and sign-up for child and youth recreation, sports and educational supports. Where applicable, families prequalify for subsidized supports. 	its value and usage would increase through evolution of the platform.	<p>Add data collection and monitoring capacity to determine what services are being used and usage rates.</p> <p>Develop interoperability between organizations for shared intake and spin-off apps or solutions.</p> <p>Add real-time and automation functionality to OneList to show available early learning and child care providers.</p> <p>Add online parenting supports (e.g., courses, gamification, chatbot features) to Parenting Now.</p> <p>Incorporate smart technology to review the Fee Assist submissions.</p>
R2	<p>Shared Electronic Health Record.</p> <p>Status: PILOT</p>	In partnership with the SNS and CYPT, SWR will support a pilot project that uses EMHware to collate electronic medical records between service organizations. EMHware enables opening of a client file portal for multiple service providers working with the same family, as well as the family themselves.	Currently, multiple service providers support in the same family with intervention supports do not have a way to engage in a shared client record. A lack of a shared record can make it challenging for service providers to provide efficient help, and to have a fulsome understanding of the history of supports.	<p>Create platform for shared records.</p> <p>Open records in the database to other service providers.</p> <p>Explore opportunity to open to families.</p> <p>Develop a common online service plan template that would allow families and service providers to review modify and comment.</p>

No.	Project Title	Description	Rationale	Implementation/Scaling
R3	Neighbourhood-Based Program/Service Delivery. Status: PILOT Special Focus: Rural, Indigenous	SWR, the Region of Waterloo, area municipalities and other partners will map community assets at the neighbourhood level (e.g., infrastructure, spaces, after-school programs) and get this information to the community. SWR Data Collaborative will support community partners to identify where further community programming or supports are needed most (e.g., literacy, mental health). There will be a specific focus on meaningful options for after-school care, support and/or skill development between 3:00-6:00 p.m. – identified as a vulnerable time for children and youth	Youth and parents identified the importance of having knowledge of and access to programs, technology, mental health supports and other social services close to home. Service providers also identified inequity of program delivery across neighbourhoods. This project will provide a better understanding of community resources and programming available. Community partners need to understand what exists, identify opportunities for new programs, and strengthen the transition from school to after school opportunities.	SWR will map community assets by neighbourhood and connect to Family Compass (R1). Parents, caring adults, service providers and youth will be able to learn what, where and when programming exists in their community. Connected Community Spaces will be prioritized to support after-school technology-enabled programming and supports (S1).
R4	STEAM Programming for Underrepresented Children and Youth. Status: SCALE, Early Years and STEAMing Ahead Status: NEW, (Perimeter) Special Focus: Indigenous	In partnership with various technology and community partners, SWR will support connecting underrepresented children and youth with STEAM learning opportunities. To start: STEAM in the Early Years with Conestoga College strengthens the interest of young children in STEAM. STEAMing Ahead with the Business and Education Partnership (BEP), will scale STEAM learning experiences in K-12 classrooms across WCDSB. Perimeter Institute and partners will develop Indigenous STEAM	STEAM continues to be an important area of learning and skill development for children and youth in today's world. However some population groups are less exposed to these opportunities, or receive less encouragement to pursue STEAM opportunities.	Scale STEAM in the Early Years to focus on providing a child development laboratory incubator where technology-enabled teaching, materials and equipment can be explored and investigated Scale STEAMing Ahead to 15 schools per year. Work with Indigenous leaders, artists and youth to shape the Indigenous STEAM program. Adapt Qaujimagatuqangit and Science Inspired Art Program workshops to include traditional Indigenous knowledge and culture. With Perimeter Institute, scale the

No.	Project Title	Description	Rationale	Implementation/Scaling
		Programming that explores societal issues through science, art and local Indigenous ways of knowing.		Indigenous STEAM Programming plan across Waterloo Region and to other communities across Canada.
R5	Future of Work and Learning. Status: PILOT	Communitech will work with Manulife Financial, Deloitte, BEP, community service providers and SWR to leverage Future of Work and Learning programs to develop and pilot programming to support children and youth in gaining life skills (e.g., financial literacy). This project will leverage Waterloo Region's technology sector to create experiences that expose youth to career opportunities and pathways to attain work success.	In Phase 2, youth shared they would benefit from more life skills training. Some youth also shared that they carry a lot of anxiety around career preparation and skill requirements. Services and training exist but youth do not feel like they know how to access those supports and services.	Future of Work and Learning provides work-based experiences, hands-on knowledge, connections to local career opportunities and helps youth be successful in the workplace. Includes: innovation labs, professional development workshops, worksite tours, job shadowing and preparation events, and financial literacy training. Technology will include gamification, e-learning programs, camps and workshops.
R6	In Pursuit of Racial Justice. Status: SCALE	Support WRDSB to build equity consciousness and improve student and staff awareness of racism, white privilege and the systemic barriers to equity. Increase recognition of, and challenges to, oppressive systems and behaviours. Increase educators' knowledge of social justice as it pertains to race.	WRDSB aspires to be more inclusive and reflective of the lived experiences of students, families and community.	Development of digital resources and technology-enabled professional development materials. An online tracking tool for shared learning will be developed. Opportunities to expand this program beyond WRDSB will be explored.
R7	Child Friendly Cities Initiative. Status: NEW	SWR and CYPT will support the co-design and implementation of UNICEF Canada's approach to UNICEF's global Child Friendly Cities Initiative (CFCI). CFCI ties to the Rights of the Child and SDGs. This will enable public recognition of community and municipal	Having a strong foundation to the SWR project rooted in the UN Convention on the Rights of the Child and the SDGs is a critical component to becoming the benchmark community in Canada for child and youth well-being.	Work with UNICEF Canada and other interested communities to establish the criteria for CFCI designation. Determine first phase implementation locally of CFCI goals. Scale implementation of CFCI goals.

No.	Project Title	Description	Rationale	Implementation/Scaling
		investments, and goals, to improve the conditions and quality of life for children and youth at a community level. We will work with the City of Leeds, UK to share learnings and best practices.		

5. Data Security & Privacy

SWR will leverage data to track and monitor progress; improve the performance of specific projects and activities; inform decision making and policy change; and fundamentally change how partners in the community come together to study, understand and ultimately improve the well-being of children and youth in Waterloo Region. SWR will ensure the security of information and data, defend against security breaches, and protect the personal information and privacy of children and youth in our community. This chapter outlines SWR's commitment to responsibly managing and protecting data.

5.1. Preliminary Privacy Impact Assessment

Through Phase 2, SWR completed a comprehensive Preliminary Privacy Impact Assessment (PPIA) to evaluate any organizational or privacy risks. The Information and Privacy Commissioner of Ontario's (IPC) office was consulted through this process and its guidance was incorporated. The PPIA and PPIA supporting documents, including confirmation of engagement with the IPC, are found in Appendix C. The following recommendations have been identified by SWR and will be incorporated in implementation:

1. A PPIA, and where necessary full Privacy Impact Assessment (PIA), will be completed to evaluate any organizations or privacy risks for each project outlined in Chapter 4. Each PIA will include:
 - A comprehensive review of data minimization and de-identification efforts, for which SWR will engage the expertise of a de-identification expert specifically for the SWR Data Collaborative
 - Where appropriate, an analysis of best practices and recommendations from the October 23, 2018 International Conference of Data Protection & Privacy Commissioners Resolution on E-Learning Platforms
2. SWR will complete a comprehensive Threat Risk Assessment (TRA)
3. SWR will consult with the Region of Waterloo's Ethics Board to explore whether projects relating to research and collection of data for children and youth meets the ethics review requirements. An ethics review will be completed if recommended by the Region's Ethics Review Board

5.2. Data Governance and Accountability

SWR will be administered by the Regional Municipality of Waterloo, led by an Advisory Committee who will guide the organization's strategic direction. For data and privacy, the Advisory Committee will be supported by the SWR Data Security and Privacy Committee (DSPC). The DSPC will advise SWR on all matters regarding data, privacy and security; and will support the PIA processes, the development of technical standards and guidelines, and the development of the SWR Data Collaborative. Where SWR has yet to develop a data principle, the Regional Privacy Policies and Procedures will be followed (relevant policies found in Appendix C). For more information related to governance, please see Chapter 7.

5.2.1. SWR Data and Privacy Principles

SWR's approach to data management is grounded in the SWR Data Principles, developed by the Phase 2 SWR DSPC, listed below. Upon implementation, SWR will review and update the Data Principles as well as any relevant privacy policies, procedures or protocols to guide all activity related to data security and privacy.

Privacy and Data Rights of Children and Youth

SWR will protect, respect and realize the rights of children and youth, as outlined in the Convention of the Rights of the Child developed by UNICEF (https://www.unicef.org/crc/index_30160.html). SWR will follow five general principles from UNICEF's Industry Toolkit for Children's Online Privacy and Freedom of Expression (2018).

1. Children and youth have the right to privacy and protection of their personal data
2. Children and youth have the right to freedom of expression and access to information from a diversity of sources
3. Children and youth have the right not to be subjected to attacks on their reputation
4. Children and youth's privacy and freedom of expression should be protected and respected in accordance with their evolving capacities
5. Children and youth have the right to access remedies for violations and abuses of their rights to privacy and free expression and for attacks on their reputation

Engaging Children and Youth in the Data Cycle

SWR is committed to developing and using data in collaboration with children and youth, and – where appropriate – parents and other caring adults. This approach better supports individual rights and well-being, giving children and youth a voice in how data is chosen, collected and used. SWR will work to engage children and youth in all stages of the data cycle: deciding what to measure; collecting data; data analysis, and using and sharing data insights.

Evidence-Informed

SWR will approach data, as well as the security and privacy of data, through an evidenced-informed lens. SWR will use the best-available research to inform data use, insights gained, and conclusions drawn from data analysis and mining. In partnership with CYPT and other key partners, SWR will continue to bring individuals and organizations across many sectors together to better understand the factors that influence the well-being of children and youth. SWR will develop and foster trusted relationships with community partners across sectors. This trust will facilitate information sharing, capacity building and coordinated action to support improved outcomes for children and youth.

Artificial Intelligence and Machine Learning

Any AI or ML algorithms used to explore or analyze data collected by SWR will be explainable, in plain language, to the point that the actions it recommends can be trusted and easily understood by the public.

Accessibility

SWR is committed to accessible, interoperable and open data approaches while maintaining the privacy of personal information, personal health information and confidential information in its custody and control. SWR will follow accessibility legislation and standards as outlined by the Accessibility for Ontarians with Disabilities Act (AODA). Specific policies and practices related to accessibility will be developed through implementation.

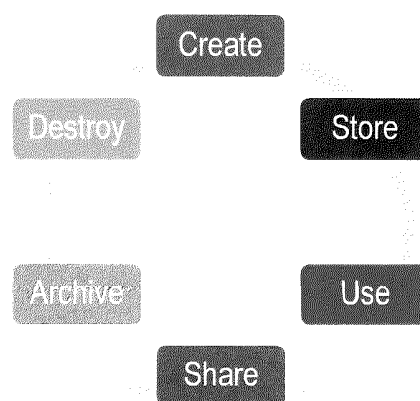


Figure 1: Policies will be created for all stages of the data cycle.

Intellectual Property Considerations

SWR will develop fulsome IP policies, procedures and protocols including foreground and background IP, upon implementation. Where possible and feasible, SWR will use existing technology and data-related solutions from private-sector entities; these entities will retain IP rights to the solution. In the event that SWR is a co-owner of foreground IP or uses another entity's background IP, SWR will secure an irrevocable, royalty-free, perpetual license to use the IP for the project. These solutions will exchange data with the SWR Data Collaborative through the standardized API, as described in Chapter 4.

If SWR develops a net-new solution it will do so under an open-source license. Other communities will be able to freely use the solutions. And open-source code will generate a developer community that will build new functionality and/or increase robustness of the solutions. All users, including SWR, will benefit from new functionality.

SWR will also examine licensing options such as GNU General Public License or Common Development and Distribution License. The selection of licensing will be on a case-by-case basis for each solution.

Leveraging Open Data

The value generated by open (and big) data would be a significant benefit to SWR and – by scaling – to other communities in Canada. SWR and the DSPC will leverage the Government of Canada's open data and information strategies to inform guidelines and processes for the SWR Data Collaborative. These will help establish consistent approaches to open data and open information available on the Dashboard.

The promise of open data lies in the application of human imagination to the uncovering of insight, and the creation of new products, services and uses for consumption and benefit to individuals and to society.

Creating Transparency thus making relevant information easier to find

Enabling Experimentation to discover need, expose variability and improve performance

Segmenting populations and users to customize actions, products and services

Replacing/Supporting human decision making with automated algorithms

Innovating new business models, products and services

According to a consultation document created by Canada's research granting councils, "In many cases, we are no longer data limited; rather we are "insight" limited. For this purpose, we need an advanced digital infrastructure ecosystem that supports the seamless access, use, re-use and integrity of data, and to focus on establishing and operating the processes required to collect, manage, analyze, interpret, share and archive big data. This ecosystem must integrate means for researchers from all sectors to utilize the technology effectively since the human infrastructure is as important as the technological. There also must be coherence, coordination and alignment across the diverse elements of the digital infrastructure." (Capitalizing on Big Data, Government of Canada, 2016)

Openness

SWR will make detailed information about governance, data principles, policies and practices relating to the management of personal information available and readily accessible to the public. SWR will follow the Region's Privacy Complaint Procedure which provides guidance on responding to complaints about the handling of personal information or personal health information.

Ownership and Control

Much of the data used by SWR will be from secondary data sources, including publicly available open data. As such, ownership and control of data (including the right to review and/or approve of use of the data by platform authorized users, prior to the publication of results) will continue to be held by the original data owners, as outlined by relevant legislation, policies or agreements.

SWR will have custody and control over any new information or data derived or collected through implementation, including the SWR Data Collaborative. Policies and processes will be developed to determine who would have access to the data and the use, disclosure and retention of data.

Use, Disclosure and Retention

Primary Data Collected by SWR

Personal information and personal health information will only be used for the purpose for which it was obtained. The use of personal information or personal health information for any other purpose will require the consent of the individual, or will be released as required by law enforcement. Personal information and personal health information will be retained in accordance with SWR policies.

All individuals have the right to see any of their personal information collected, analyzed and shared by SWR. Individuals may challenge the accuracy of personal information and ask for corrections.

Secondary Data

Where secondary data sources are being used, SWR will adhere to the relevant use, disclosure and retention policies outlined by the original data owner and relevant legislation, policies and agreements. All individuals have the right to see any of their personal information collected, analyzed and shared by SWR. All requests related to secondary data will be referred back to the original data owner.

Consent

SWR will ensure each individual is aware of and consents to the collection, use and disclosure of new personal information or personal health information.

Children's privacy is best protected where children or legal guardians (on a child's behalf) provide free and informed consent for the processing of personal information. For consent to be meaningful, it must be sought in a manner and form that matches each individual's level of understanding. To obtain meaningful consent from children, SWR will communicate in plain language and will consider the use of innovative techniques (e.g. diagrams, images and videos) to explain to children (and/or their guardians) how their personal information would be used.

Accuracy

SWR will ensure that personal information and personal health information is accurate, complete and up-to-date as is necessary for data use or disclosure. SWR will strive to avoid data poverty; data collection methods and instruments will ensure individuals, cohorts and groups are adequately represented in order to avoid analytical bias. Only valid and reliable data, as identified by the DSPC, will be used or disclosed.

Data Minimization and De-identification

SWR will pursue minimally invasive data collection alternatives where possible, implement data minimization and de-identification of all personal information at the earliest opportunity and mitigate the potential for re-identification. Where secondary data sets are used, all personal information or personal health information that is not relevant to the use outlined by the DSPC will be excluded.

Limiting Collection & Disuse

SWR will limit the collection of personal information or personal health information to the data needed for the purposes identified by the DSPC. Only information that is required will be collected. As part of Data Management and Use Policy development, the SWR DSCP will follow Responsible Data (RD) processes including policies for deletion and/or archiving after intended use, initiation of compliance checks during and after use, mitigation of unintended use and ongoing measures to remain transparent to the public.

5.3. Security and Safeguards

SWR will adopt Privacy by Design Principles, as developed by Dr. Ann Cavoukian, former Information and Privacy Commissioner of Ontario. SWR will protect personal information, personal health information and confidential information and ensure secure storage and transmission of data and assurance of effective cybersecurity. Administrative, technical and physical safeguards to prevent unauthorized access, disclosure, copying, use or modification will be considered.

SWR will follow the Region of Waterloo's Privacy Breach Procedure (Appendix C) until full SWR procedures have been developed. Upon implementation SWR will review and make additions to the Privacy Breach Procedure if appropriate, including the identification of key stakeholders that will be part of the SWR security breach response team and the actions that need to be taken to ensure compliance with Canada's privacy regulations.

Administrative, technical and physical safeguards will be implemented to prevent unauthorized access, disclosure, copying, use or modification. SWR will consider the following:

Administration safeguards

- Audit log of all system changes/searches
- Audit logs maintained to identify and review usage patterns; supports proactive and reactive auditing based on triggered events (privacy audits)
- Ability to create audit reports
- Ability to restrict access to data based on user rights/roles
- Unique user IDs
- Username and password required to access system
- Ability to force password changes every 45 days and set password criteria e.g. 10 characters in length, includes 1 uppercase and/or special symbol and/or number, and locks after 3 attempts
- Ability to apply a records retention schedule to permanently delete or archive data as required

Technical safeguards

- SSL for establishing an encrypted link between a web server and browser
- Encryption for data at rest

Physical safeguards

- Servers located in Canada
- 24/7 security staff
- Security card access/biometric authentication
- Surveillance system
- Mantraps for single person verification
- Intruder and door tampering alarms
- Secure, managed loading dock
- Locked racks and cabinets
- Backups and backup power systems

For specific SWR Data Collaborative security and safeguards, refer to Chapter 4.

6. Performance Measurement

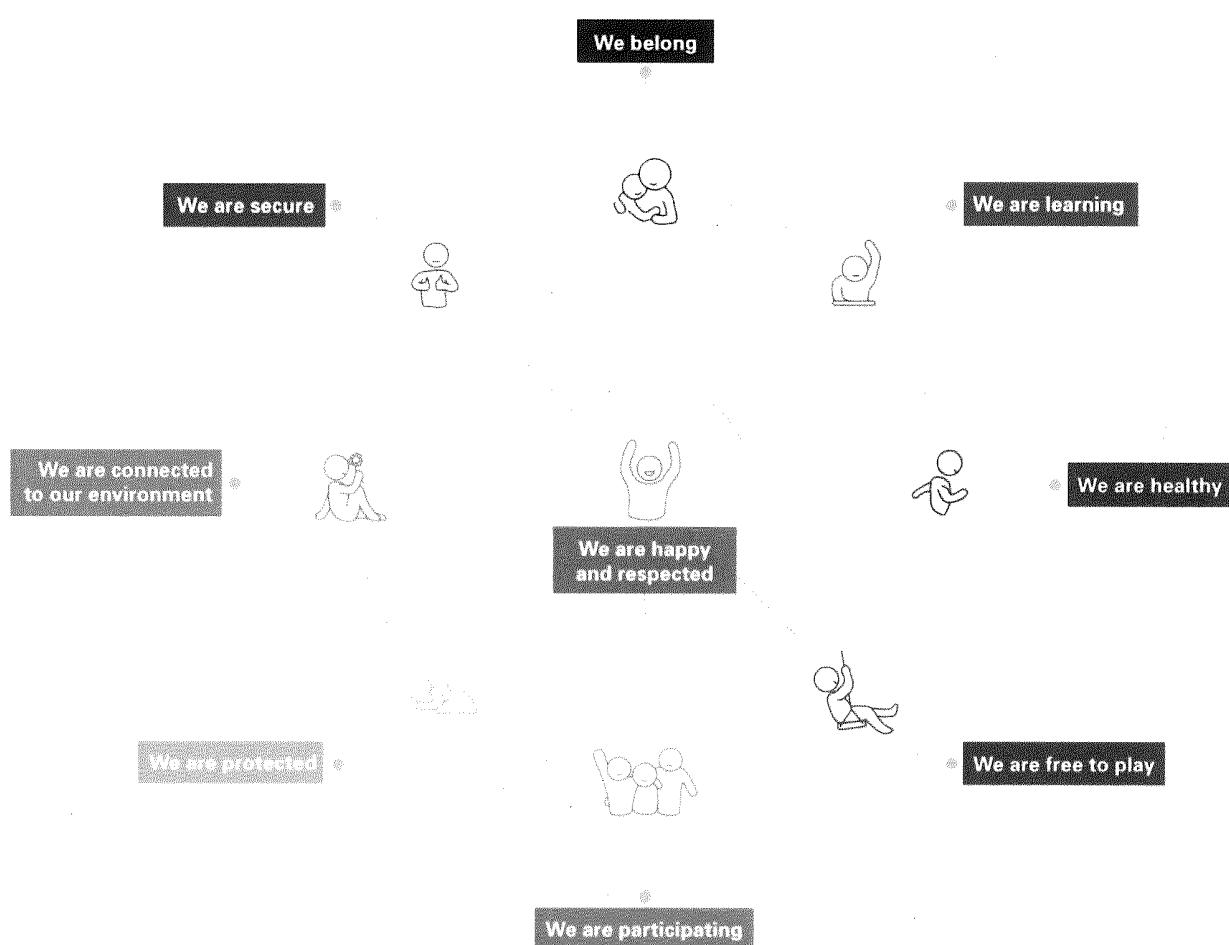
This chapter provides an overview of SWR's performance measurement framework based on the CY-Index. This chapter also outlines SWR's approach to evaluation and the logic model for implementation - including the activities, outcomes and indicators identified to track and monitor success.

6.1. The Canadian Index of Child and Youth Well-being

Many Canadians believe Canada is one of the best places to grow up. Unfortunately, the data and stories from children and youth indicate there is room for improvement. In response, UNICEF Canada developed the CY-Index as a framework to communicate to Canadians what this country is like for children and youth (from birth to 18), track progress for child and youth well-being and guide action to address the greatest challenges.

UNICEF Canada launched the beta CY-Index in November, 2018 and continues to finalize the framework based on feedback from experts and Canadians. The CY-Index measures 125 indicators over 9 dimensions of children and youth's lives (as outlined in the diagram below). The CY-Index examines:

- Important aspects of the lives of children and youth that are, and are not, getting better over time
- Where there are smaller, and where there are wider gaps in outcomes between children
- Where Canada does better than, and lags farthest behind, peer countries
- The extent to which the SDGs most relevant to children and youth are realized
- The opportunities for, and impacts of, investments, programs and policies



6.2. Waterloo Region: The Canadian Benchmark for Child and Youth Well-being

With support from UNICEF Canada and community partners, SWR will adopt, adapt and test the CY-Index in a local context. UNICEF Canada has done the foundational work to develop the framework and indicators important in measuring the well-being of children and youth. When applying the CY-Index, SWR will work to overcome data

limitations including unavailability of national indicators due to small sample size, or inability to disaggregate to the Census Metropolitan Area (CMA). The adaptations will help inform application of the CY-Index to smaller communities across Canada.

SWR will use the CY-Index to better understand the well-being of children and youth in Waterloo Region, to monitor changes over time and to understand how local children and youth are faring compared to the rest of the country. In addition, the CY-Index will become a shared measured framework for Waterloo Region, for example:

- Waterloo Region currently uses the CIW to measure and monitor the well-being of the population generally. While it is a powerful tool, it does not capture the experiences of children and youth effectively. The CY-Index dovetails well with the CIW.
- Using the CY-Index framework, local data will be shared through the Child and Youth Well-being Dashboard. The results will help SWR identify where the community needs to target activities and resources to support children and youth.

The development of local measures, best-practices, and a data sharing and analysis platform (SWR Data Collaborative and the Child and Youth Well-being Dashboard, see Chapter 4) will be prototyped in Waterloo Region and made available across Canada. Other Canadian communities will be able to implement these measurement structures to see how their children and youth are faring.

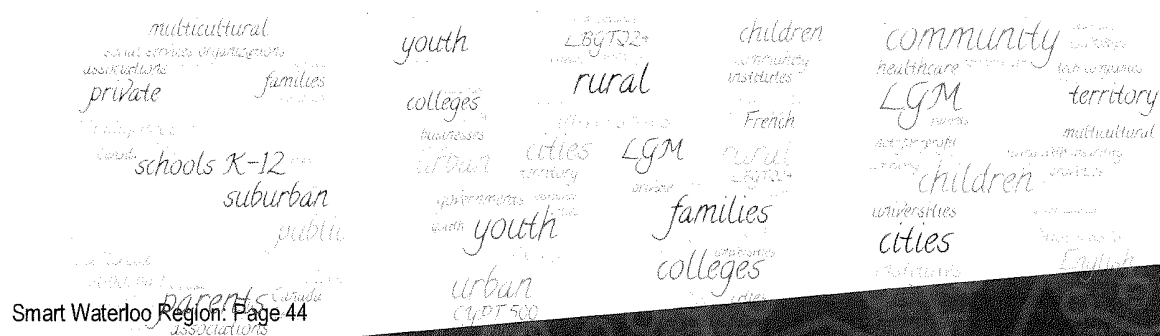
6.3. Performance Measurement Plan

The activities, outputs and outcomes identified in the Logic Model are organized by the areas of focus and root cause, as well as a focus on data, research and knowledge. For the full Logic Model, refer to Appendix B.

Approach to Evaluation

With the support of community partners, including Wilfrid Laurier University, SWR will to use a combination of an outcomes-based and developmental evaluation approach to measure results at all stages of implementation.

Outcomes-based measures will assess if SWR and the technology and data-enabled solutions (outlined in Chapter 4) have made a difference in the well-being of children and youth. SWR has identified – based on research, data and consultation with community stakeholders – specific indicator targets to track progress. The complexity of child and youth well-being and the implementation of technology and data-enabled solutions add an additional layer of challenge in measurement. SWR will also, therefore, rely on developmental evaluation to assess the responsiveness of SWR to the needs of Waterloo Region, and to monitor the strides being made as SWR progresses. Desired outcomes and specific indicators may change over time as the community changes. SWR recognizes the importance of being nimble and adaptable in its approach in order to better reflect the reality and ever-changing needs of children and youth and the environments in which they live.



6.3.1. Logic Model

The following is a high-level summary of the logic model. A more detailed logic model, mapping each project against the focus areas and root causes, may be viewed in Appendix B.

Smart Waterloo Region			
Waterloo Region will be the benchmark community for child and youth well-being in Canada			
	Technology & Data Enabled Activities/Outputs	Immediate and Intermediate Outcomes	Long-Term Outcomes
Data, Research & Knowledge	Centre of Excellence Canadian Index of Child and Youth Well-being SWR Data Collaborative & Dashboard Indigenous Data Strategy Data Collection and Analysis in Schools	<ul style="list-style-type: none"> Improve knowledge and awareness of child and youth well-being and influencing factors Increase data and research capacity Improve responsiveness of programs and services to meet the needs of children, youth and families 	More children are ready and have the skills needed to start school
Early Childhood Development	CoHealth Online Prenatal and Parenting Programming Digital Early Learning Portfolio Kindergarten Self-Regulation & Foundational Early Learning	<ul style="list-style-type: none"> Increase in identification of needs Improve community awareness of programs, services and supports 	Improve literacy among children
Literacy	Tablets for Family Literacy	<ul style="list-style-type: none"> Improve access / decrease barriers to programs, services and supports 	Improve literacy among youth
Mental/Emotional Health	Social-Emotional Learning for Children, Youth and Caring Adults Virtual Counselling Youth Mental Health Service & Incentivizing Health Apps	<ul style="list-style-type: none"> Increase use of programs, services and supports Increase knowledge and skills among caring adults Increase in life skills among children and youth Increase in social-emotional learning skills 	Improve social-emotional well-being among children
Sense of Belonging	Connected Community Spaces (Indoor & Outdoor) Engaging and Innovative Learning Environments Digital Citizenship Strategy Volunteering Platform Youth e-Mentorship Newcomer Youth & Family Supports Re-Engagement of Students Indigenous Child and Youth Leadership Program	<ul style="list-style-type: none"> Increase in children and youth being involved in decisions that affect them Improve cohesion and timeliness of the system Increase in empathy toward children and youth and their well-being Increase in children, youth and caring adults feeling supported 	Improve mental/emotional health among youth
Root Cause	Family Compass Platform Shared Electronic Health Record Neighbourhood-Based Service/Program Delivery STEAM Programming for Underrepresented Children and Youth Future of Work and Learning In Pursuit of Racial Justice Child Friendly Cities Initiative	<ul style="list-style-type: none"> Increase in engagement of children, youth and caring adults Improve child and youth well-being outcomes including, but not limited to: <ul style="list-style-type: none"> Academic success Physical activity and health 	Improve the levels social cohesion Increase sense of belonging among youth

6.3.2. Long-Term Outcomes and Performance Indicators

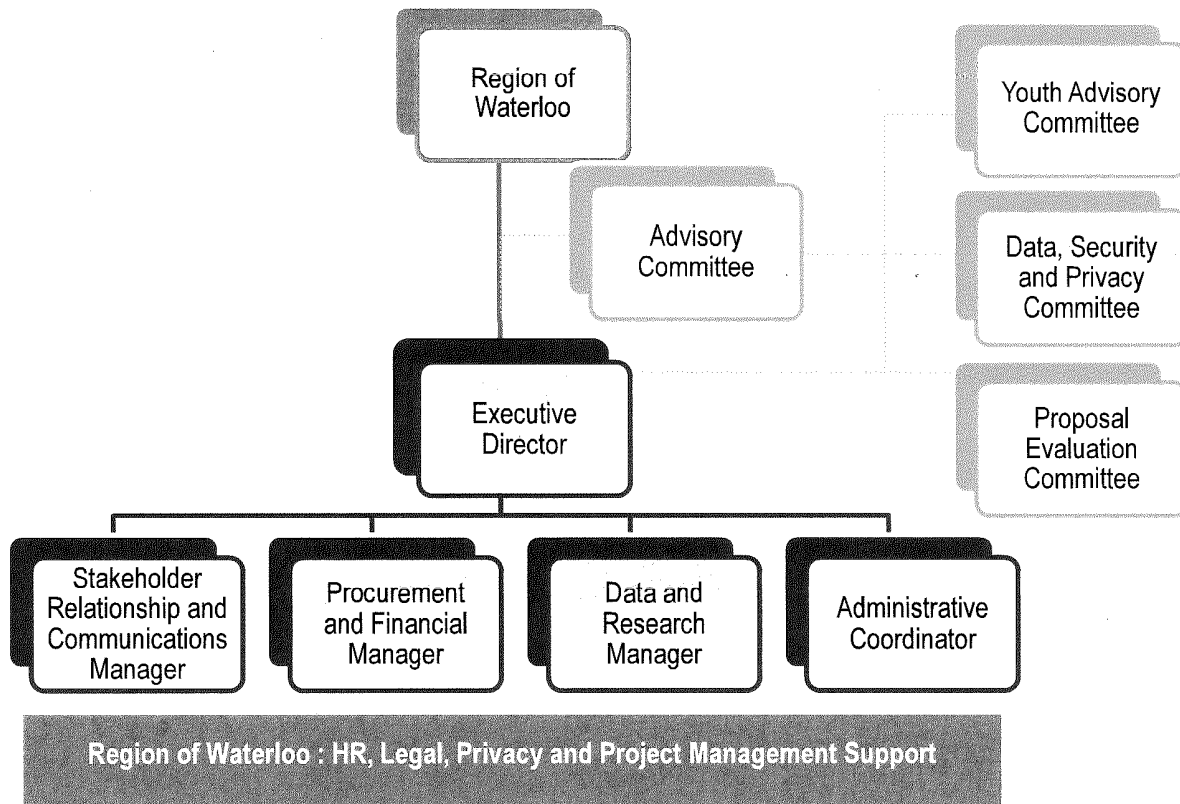
The CY-Index will be the framework by which SWR measures and monitors the well-being of children and youth in Waterloo Region. This table outlines the long term outcomes and associated performance indicators which have been selected as key determinants of success for local child and youth well-being. These can be measured to understand the impact of programming over the short, medium and long-term. Where appropriate, CY-Index indicators have been identified as the performance indicators for SWR and are identified as such. † Indicators used here are congruent with those included in UNICEF Canada's CY-Index

Area of Focus	Long-Term Outcome	Indicator	Source	Baseline	Target (2024)
Early Childhood Development †	Decrease the percentage of children not ready for school with the skills needed.	Percentage of Senior Kindergarten (SK) children in Waterloo Region who are vulnerable to difficulties in learning on the Early Development Instrument (EDI) (scoring low in one or more domains <10th percentile).	EDI, Ministry of Education (2015)	32.8%	26.0%
Literacy †	Increase the percentage of children reading well in primary school.	Percentage of all Grade 3 students at or above the Provincial Standard for reading.	Grade 3 EQAO, EQAO (2016)	67.0%	75.0%
Literacy †	Increase the levels of reading achievement among Grade 10 students.	Percentage of fully participated students (first time eligible) who were successful on the Ontario Secondary School Literacy test (OSSLT).	Grade 10 OSSLT, EQAO (2016)	82.0%	85.0%
Mental / Emotional Health †	Improve the social-emotional well-being of children.	Percentage of SK children in Waterloo Region who are vulnerable in the emotional maturity domain (i.e., scoring low, < 10th percentile) on the EDI.	EDI, Ministry of Education (2015)	14.8%	12.0%
Mental / Emotional Health †	Increase the percentage of youth self-reporting positive mental health.	Percentage of youth, 12 to 17, having positive self-rated mental health.	CCHS, Statistics Canada (2014)	80.4%	82.0%
Sense of Belonging † (proxy)	Increase the level of social cohesion in Waterloo Region.	The level of social cohesion, as measured by the Social Cohesion Index.	Kindergarten Parent Survey, Offord Centre (2015)	7.6 / 10	8.2 / 10
Sense of Belonging †	Increase the level of sense of belonging to the local community among youth.	Percentage of youth, 12 to 17, with a "very strong" or "somewhat strong" sense of belonging to their local community.	CCHS, Statistics Canada (2014)	78.6%	84.0%

7. Governance

SWR brings together the Region of Waterloo and the seven area municipalities, the social service and technology sectors, business community, post-secondary institutions and children, youth and families. This chapter outlines SWR's governance framework, including the roles and responsibilities of partners and the SWR Implementation Team.

Organizational Chart



7.1. Committees

7.1.1. Advisory Committee

SWR will be guided by a 12-15 person Advisory Committee consisting of community members with a vested interest in the well-being of Waterloo Region's children and youth. Members will be drawn from the public and private sectors and will include representatives from municipalities, child and youth service providers, education and technology and key partner organizations. The Advisory Committee will include a minimum of three youth members from the Youth Advisory Committee (described below). Members will represent the diversity of Waterloo Region (e.g., cultural, gender, geography, etc.).

The Advisory Committee will have delegated authority from Regional of Waterloo Council for implementation oversight and decision-making. The Committee will guide the strategic direction of SWR and ensure it stays true to its guiding principles; be responsible for the approval of sound strategic investments (projects, time, marketing resources, etc.); expenditures and funding agreements; and help to connect SWR to the broader community. Additionally, the Advisory Committee shall be responsible for establishing policies and protocols for SWR and supporting committees, and modifying these as needed. Terms of Reference (TOR) outlining the roles and responsibilities of the Advisory

Committee will be developed and approved by Regional Council. Initial nominations for Committee members will be solicited from the organizations or sectors represented on the Phase 2 Advisory Committee.

Supporting Committees

In addition to the Advisory Committee, SWR will have three sub-committees to support vital functions such as engagement, performance measurement and procurement.

Data, Security and Privacy Committee

The Data, Security and Privacy Committee (DSPC) will be comprised of approximately 10 data, research and/or privacy experts from the social service sector, post-secondary education, government, and private organizations who will advise SWR on all matters regarding data, privacy and security. Recommendations from the DSPC will be forwarded to the Advisory Committee. DSPC members will be nominated by organizations or sectors represented in the Phase 2 DSPC and approved by the Advisory Committee. DSPC responsibilities will include:

- Oversight of the SWR Data Collaborative, including ongoing privacy and security considerations
- Supporting ongoing performance measurement
- Supporting completion of PIAs and Threat Risk Assessments
- Ensuring privacy policies and practices are followed (including relevant municipal, provincial and federal privacy regimes), and ensuring adherence to SWR Data and Privacy Principles

Proposal Evaluation Committee

The Proposal Evaluation Committee (PEC) will consist of 4-5 community representatives responsible for reviewing submissions from Requests for Proposals (RFP) generated by SWR. PEC members will have procurement and technology evaluation experience and will make recommendations to the Advisory Committee. Initial nominations for PEC members will be solicited from the organizations or sectors represented on the Phase 2 Advisory Committee and DSPC, and approved by the Advisory Committee. PEC responsibilities will include:

- Development – in conjunction with the DSPC and the SWR Implementation Team – of a decision-making framework for analysis of appropriate engagement, technology and data solutions (e.g., scalability)
- Review of RFP documentation prior to release to the public
- Coordination of reviews and approvals of RFP
- Review and evaluation of RFP responses in accordance with decision-making framework
- Recommending selected solutions to SWR Advisory Committee for approval

Youth Advisory Committee

The Youth Advisory Committee (YAC) will include 20-25 members, between the age of 13 and 18, representing the geography and diversity (age, gender, those with disability, etc.) of young people from across Waterloo Region. The YAC will provide feedback on engagement, participate in engagement and communications, provide feedback on strategy and solutions, and act as community ambassadors for SWR. Term limits will be outlined in the TOR. There will

Youth Governance Best Practices

Through the existing Youth Advisory Committee and extensive youth engagement, SWR has developed a set of recommended practices for youth governance. See Appendix A for more on best practices.

- Assign real responsibilities
- Flexible role structure
- Routinized, weekly or bi-weekly meetings
- Meet in interesting, creative places
- Use an app like Slack to facilitate communications
- Support youth leadership with training, tools and resources
- Build trust over the long term
- Engage and challenge adults
- Add sub-committees to channel interests
- Build relationships with other youth groups

be an open call for YAC members via an application process. YAC members will be approved by the Advisory Committee. YAC responsibilities will include:

- Co-design of engagement solutions from a youth perspective
- Support SWR Implementation Team to develop communications and media strategies for youth
- Participate in SWR and other community events as community ambassadors of SWR

7.2. Smart Waterloo Region Implementation Team

SWR will be staffed by a dedicated team charged with managing the project activities that will help achieve the SWR Challenge Statement. The SWR Implementation Team will manage project plans and finances, implement activities, engage committees, coordinate with Infrastructure Canada and manage relationships with community partners, children and youth. The SWR Implementation Team will consist of five full-time equivalent (FTE) staff employed by the Region of Waterloo and funded through the *Smart Cities Challenge*.

The SWR Implementation Team will be housed in the Region of Waterloo Planning Development and Legislative Services Division. Additional administrative support will be provided by the Region of Waterloo including: Project Management, Legal and Privacy expertise. SWR will leverage the Region's practices and policies for employee recruitment, management, and professional development.

SWR Implementation Team Roles and Responsibilities

Position	Responsibilities	FTE	Start
Executive Director	SWR Implementation Team lead and a non-voting member of the Advisory Committee Report to Advisory Committee Leads reporting to Infrastructure Canada Supporting the PEC Project management Lead, relationship management Primary, spokesperson/media contact for initiative	1.0	Fall 2019
Stakeholder Relationship and Communications Manager	Reporting to the Executive Director Communications and community engagement lead Community relations, joint project management with partners Communications, marketing and engagement lead, support with project implementation and the YAC	1.0	Fall 2019
Data and Research Manager	Reporting to the Executive Director Support the DSPC (non-voting member) Lead the development, implementation and maintenance of the SWR Data Collaborative Lead ongoing performance measurement and evaluation Lead the development of and adherence to privacy policies, procedures and legislation	1.0	Fall 2019
Procurement and Financial Manager	Reporting to the Executive Director Non-voting member of the PEC and financial management lead Financial management of grants and operations, disbursement and contract management, government reporting, contract management (flow-through funding)	1.0	Fall 2019

Administrative Coordinator	Reporting to the Executive Director Assists with administrative needs of SWR, the Advisory Committee and Supporting Committees Project management assistance as needed	1.0	Fall 2019
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7.3. Partners

There are over 100 organizations involved in SWR to date. These partners include social-support agencies and technology companies, school boards, municipal government and universities. The following table outlines partnerships key to implementation at time of writing and the project(s) involvement for each partner. (See Chapter 4 for Project Descriptions)

Partners will also be brought into SWR as activities move forward. Please note that the organizations outlined below are directly engaged in SWR activities. A complete list of letters of contribution (Appendix D). Financial and in-kind support is outlined in Chapter 10.

Overview of SWR Partners

Partner	Project Code	Role
UNICEF Canada	D1, D2, D4, R7	Performance Measurement, Scaling
Children and Youth Planning Table of Waterloo Region	D1, D2, D4, R1, R3, R7	Project Development, Partner Facilitation, Community Engagement and Awareness, Performance Measurement, Research
School Boards in Waterloo Region	D2, D5, E4, M1, S2, S3, S4, S9, S10, R4, R3, R6	Program Delivery, Partner Facilitation, Engagement, Performance Measurement, Community Engagement and Awareness, Research
Post-Secondary Institutions	D1, E3, S2, S4, S5, S8, R4	Research, Project Development, Program Delivery, Prototyping, Impact Modelling, Performance Measurement, Governance Policy Support
LAUNCH and HIP Developments	D1, R3, S1	Program Delivery, Connected Community Space Provider
Communtech Corporation	S4, R5	Data Sharing and Capacity Building, Performance Measurement, Program Development and Delivery, Advisory Services, Technology Partner Facilitation, Use of Space
Vidyad	NA	Use of Space, Technology Partner Facilitation, Project Development
Region and Area Municipalities	D2, E2, S1, S2, R3, R7	Program Delivery, Administrative Support, Connected Community Space Provider
Rogers Communications	S1	Connectivity Providers
Ontario Ministry of Education	D1	Data Sharing and Analysis, Education Technology Piloting, Research, Scaling
YMCAs of Cambridge and Kitchener-Waterloo	E1, S7, S9, R1	Program Delivery, Scaling

Partner	Project Code	Role
YMCAs of CKW, Greater Vancouver, North Alberta, Calgary, Winnipeg, Quebec, Greater Halifax	S7	Scaling
Volunteer Action Centre Waterloo Region, Volunteer Canada	S5	Program Delivery, Scaling
Waterloo Wellington Local Health Integration Network	E1, M3	Program Delivery, Scaling
Philanthropic Foundations	NA	Funding Partner
Big Brothers Big Sisters of Waterloo Region	S6	Program Delivery
Sustainable Development Solutions Network	D1, D2	Performance Measurement, Scaling
Rural Child and Youth Wellbeing Initiative (Collaborative Project Partners)	M3, S4	Rural Program Delivery Partner, Scaling
Anishnabeg Outreach	S1, R3	Indigenous Program Delivery
Perimeter Institute and Inuksuk High School	R4	Indigenous Program Delivery
Ontario Centre of Excellence for Child and Youth Mental Health	D1	Research, Scaling
District School Board of Niagara	D1	Data Research, Program Design
KW Counselling Services	R1	Project Delivery
Social Venture Partners	NA	Organizational Capacity Building
Waterloo Region Small Business Enterprise Centre	R5	Program Delivery
Cambridge Chamber of Commerce and Kitchener-Waterloo Chamber of Commerce	NA	Private Sector Partner Facilitation, Project Development
Homewood Research Institute	D1	Research, Prototyping, Scaling
Leadership Waterloo Region	R5	Program Delivery
Business and Education Partnership of Waterloo Region	R4, R5	Program Delivery
Waterloo Regional Police Service	NA	Program Delivery, Community Engagement
Ontario Trillium Foundation	D4	Research, Community Engagement, Scaling
Canadian Index of Wellbeing	D4	Research, Community Engagement, Scaling
Special Needs Strategy Planning Table	R1, R2	Project Development
Project Read	L1	Program Delivery

8. Project Management

SWR is an ambitious undertaking. It has to be. It has to address the concept of well-being with multi-variate, collaborative, boots-on-the-ground programming and services enabled by integrated technology. SWR will provide direct support for the design, testing and deployment of the projects outlined in Chapter 4 through engagement

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activities, planning, connections to resources and hands-on management. Community partners – specifically service delivery providers – will be responsible for program and service delivery to children, youth and caring adults.

Agile Project Management and Design Thinking

SWR will employ agile project management and design thinking principles. This will allow SWR to manage and develop iteratively, so insights discovered during development and testing can be incorporated into ideation of the next version(s). This approach creates a high degree of alignment and buy-in from stakeholders and community members, and is well-suited to complex initiatives where the requirements are constantly evolving and solutions are not yet known.

Transition Team

The Phase 2 team will continue to facilitate and support start-up activities necessary for SWR operations until the necessary positions (see Chapter 9) are filled. Staff will be hired in accordance with talent attraction and recruitment processes and policies in place at the Region of Waterloo as appropriate (see Chapter 9). As such, SWR staff will have the necessary skills and knowledge to administer and oversee project implementation including reporting, vendor selection and management of data, risks and finances.

Leveraging Community Expertise

SWR will work with experts and staff from partner organizations (e.g., Communitech, post-secondary institutions, CYPT) to ensure project design, implementation and stakeholder management are inclusive and the projects accurately reflect community needs. Where necessary, SWR will use consultants for engagement activities, data platform development (e.g., programming), data analysis, ideation and prototyping, performance measurement and economic impact modelling.

The Advisory and Proposal Evaluation Committees will help to ensure SWR community representation and participation in the implementation of projects and the selection of vendors. Please see Chapter 7 for additional information regarding the responsibilities of SWR Committees. For information on Financial Controls relating to expenditures and procurement, please see Chapter 10.

8.1. Project Activities

The Chart below outlines the project activities, timelines, milestones, dependencies and sequencing for each SWR project. All projects outlined herein require funding – in whole or in part – through the *Smart Cities Challenge* grant. Chapter 4 provides an explanation of each project and the expected outcomes are outlined in Chapter 6, including the outcome codes (e.g., D1) relating to the logic model.

Communications Planning

SWR will consult with stakeholders, youth and partners to develop a Communication Strategy and associated tactical plan. Throughout implementation, SWR will further evolve the SWR brand, develop messaging for specific audiences, generate awareness, drive the use of SWR programs and services, keep the community informed, build and strengthen relationships, and encourage the community to engage with SWR.

SWR will use agile methods and leverage community support – including consultation with children and youth – to develop strategies, plans, tactics and communications tools. This will enable SWR to provide relevant information and respond quickly to new information, outcomes and community-engagement feedback. Core elements of SWR communications will include:

- Sharing SWR activities, outcomes, reports and evaluations
- Development of internal, external and social media communication plans, protocols and instruments

- Creation of a sub-brand developed with, and for local children and youth
- Identification of audiences and subsets (e.g., rural youth, Indigenous youth, newcomer youth), rational audience groupings, communications requirements (e.g., language, place, ability) and appropriate tools/media
- Creation of tailored messages with and for youth, children, caring adults, community members, diverse groups (e.g., Indigenous, rural) and other stakeholder groups (e.g., technology sector, media, government)
- Development of communications tactics, tools and events

8.1.1. Operational Timeline

Activity	Start	Finish	Milestones	Dependencies
Regional Council Delegation	Aug 2019	Sep 2019	Delegated authority to SWR Advisory Committee for: approval authority of projects, selection of vendors, and budget approval	Operational, governance structure, and financial controls established Advisory Committee Members identified
Advisory Committee	Sep 2019	Nov 2019	Advisory Committee established Terms of Reference and meeting schedule completed	Regional Council delegation
Office Location and Infrastructure	Aug 2019	Oct 2019	Temporary and long-term office location secured	N/A
Staffing	Aug 2019	Dec 2019	Executive Director hired (October) operational staff hired by end of December	N/A
Operational Policies	Aug 2019	Nov 2019	Draft Operational Policies completed Conflict of Interest Policies completed	Council delegation Advisory Committee established
Financial and Risk Management Controls	Aug 2019	Dec 2019	Draft financial controls completed Financial and project reporting framework completed Draft risk management controls for project management completed	N/A
Request for Proposals Process and Policies	Aug 2019	Dec 2019	Project scoping and expert/partner Engagement process established Procurement policies established Criteria committee selection process completed Project approvals process established	N/A
Partnership and Community Updates	Sep 2019	Jan 2020	Monthly updates to community partners Social media and website updates on start-up	N/A
Community Engagement	Sep 2019	Dec 2024	Engagement plan scoped Integration of gamified engagement Completion of 8 - 12 stakeholder, youth, or public engagement sessions (Annual) Insights report completed (Annual)	Engagement consultant secured Gamified Solutions identified and customized for engagement

Activity	Start	Finish	Milestones	Dependencies
			Data and results from engagement integrated into program design, data collaborative, and RFP scoping for other SWR projects (Annual)	
Develop Communication Strategy and Plans	Jun 2019	Dec 2024	Outline communications strategy for implementation Develop crisis communications plan Build communications plan including supports for accessibility and inclusion (Annual)	Hiring of communications manager Consult stakeholders and partners

8.1.2. Project Timeline

Due to the volume of projects in SWR Implementation, the table below shows start, end and duration only. A complete Gantt chart showing dependencies may be found in the appendices.

	Name	Q4 2019	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	Q1 2023	Q2 2023	Q3 2023	Q4 2023	Q1 2024	Q2 2024	Q3 2024	Q4 2024
D1	Child and Youth Well-being Public Awareness Campaign																					
D1	Building Data Capacity																					
D2	SWR Data Collaborative and Dashboard																					
D3	Indigenous Children and Youth Data Strategy																					
D4	Community Child and Youth Well-being Survey																					
D5	Data Collection and Analysis in Schools																					
E1	CoHealth																					
E2	Online Prenatal and Parenting Programming																					
E3	Digital Early Learning Portfolio																					
E4	Kindergarten Self-Regulation and Foundation Early Learning Skills																					

L1	Tablets for Family Literacy																			
M1	Social-Emotional Learning in Schools (WRDSB)																			
M2	Social-Emotional Learning for Caring Adults																			
M3	Virtual E-Counselling																			
M4	Youth Mental Health Services App																			
M5	Incentivizing Health Activities App																			
S1	Indigenous Connected Community Space																			
S1	Wi-Fi Network SSID																			
S1	Connected Community Spaces																			
S2	Connected Outdoor Spaces																			
S2	Digitization of Local Indigenous Historical Content																			
S3	Engaging and Innovative Learning Environments (Third Teacher)																			
S4	Digital Citizenship Strategy																			
S4	Internet Safety - Low German Mennonite Population																			
S5	Meaningful Volunteering Platform (VolunteerAttract)																			

[illegible]

[illegible]

*New technology- and data-enabled solutions to support achieving SWR outcomes. Funded by community partners.

9. Implementation & Risk

9.1.1. Duty to Consult with Indigenous Groups and Modern Treaty Obligations

SWR is committed to supporting the well-being of Indigenous children, youth, and families in Waterloo Region. During the Phase 2 proposal development process, engagement with local Indigenous community representatives identified technology and data-enabled solutions that will support well-being for Indigenous children, youth, and families (Refer to Chapter 4). Through partnerships with Indigenous-serving organizations and community members in Waterloo Region, the SWR proposal will develop and implement solutions locally and share with other communities across Canada.

Waterloo Region is located in south-western Ontario with the Grand River flowing through a large part of the municipality. Waterloo Region does not have a First Nations reserve within or adjacent to the municipality. The Region of Waterloo completed an assessment of the SWR proposal and has identified the following four claims of the Six Nations of the Grand River that may involve the Region of Waterloo:

- a. Claim to the bed of the Grand River and islands thereon
- b. Claim to the tow path lands along the Grand River
- c. Claim to hunting and fishing rights in southern Ontario pursuant to the Nanfan Treaty of 1701
- d. Claim to the six mile area on either side of the Grand River

The Region of Waterloo has not identified any other First Nations treaty right or claim to lands within Waterloo Region. The identified Six Nations' claims entail a claimed right of ownership or use of lands within Waterloo Region that may be adversely affected through new development or infrastructure within the municipality. The SWR proposal, which relates to the development of enhanced social support programs for youth, does not involve such new developments or infrastructure works.

9.1.2. Community Employment Benefit

Skilled, Talented and Diverse

SWR follows fair and equitable hiring practices as outlined by the Region of Waterloo (<https://www.regionofwaterloo.ca/en/regional-government/accessibility-and-diversity.aspx>) and, as such, is mandated to attract and retain a skilled, talented and diverse workforce. Local labour market dynamics and the nature of the project suggest opportunities will be most likely for the following target groups: youth, women, recent immigrants (new comers), indigenous people, and social enterprises (through value of contracts given).

Procurement and Partner Practices

Procurement practices will emphasize opportunities for target groups (Chapter 9). Requests For Proposals (RFP) will include a stipulation that vendors must provide and report on employment opportunities against established Community Employment Benefits (CEB) requirements.

In addition, SWR will collect employment data from community partner organizations involved in the creation, deployment and management of SWR-funded projects. These organizations will be encouraged to provide inclusive and meaningful employment and/or procurement opportunities for Canadians in the target groups noted.

Reporting

SWR will target and report Community Employment Benefits (CEB) requirements annually during the project funding period. The report will include data about employees and contractors from the target groups specified as employed by SWR, vendors and community partners. Upon successful award of the *Smart Cities Challenge* grant, SWR is pleased to work with Infrastructure Canada to specify reporting requirements and goals including, but not limited to, number of hours by target population, value of contracts and qualitative narration regarding successes and challenges.

9.1.3. Climate Lens Assessment (CLA)

The projects outlined in the SWR do not apply to climate change adaptation, resilience or disaster mitigation projects.

9.1.4. Other Applicable Laws, Regulations and Policies

SWR will ensure that the implementation of all projects identified in the proposal are in compliance with all applicable laws, regulations, and policies in Waterloo Region, Ontario, and Canada.

9.2. Risk Mitigation Framework

SWR will use a risk management framework to identify and assess categories of risk appropriate to the organization's strategy. The framework outlined below is adapted from the Deloitte Enterprise Risk Assessment model for use in innovation hubs and not-for-profits. This framework includes six broad categories of risk. The categories and types of risk are outlined below. Application to each chapter is referenced in each risk area.

Risk category	Risk, risk definition, mitigation
Strategic	<p>Governance and accountability: Governance (Ch 7)</p> <p>The risk that there are inadequate practices and processes to support good governance and effective accountability and oversight by the organization and its committees.</p> <p>Mitigation activities:</p> <ul style="list-style-type: none"> ▪ TOR outlining practices, processes, accountability, and conflict of interest developed and adopted for all committees ▪ External expertise engaged to review governance practices and processes ▪ Leverage or adopt existing governance and accountability practices at the Region of Waterloo
Strategic	<p>Management governance and accountability: Governance (Ch 7)</p>

Risk category	Risk, risk definition, mitigation
Strategic	<p>The risk that there are inadequate practices and processes to support good governance and effective accountability and oversight by the leadership team.</p> <p>Mitigation activities:</p> <ul style="list-style-type: none"> ▪ Annual review of governance and accountability practices and processes for SWR Implementation Team ▪ Intensified governance and procedural reviews by Region of Waterloo to ensure governance policies and procedures are thorough and being followed ▪ External expertise engaged to review governance practices and processes
	<p>Innovation: Technology- and Data-Enabled Solutions (Ch 4)</p> <p>The risk that the organization will not be able to develop/maintain programming, partnerships and networks to meet community needs.</p> <p>Mitigation activities:</p> <ul style="list-style-type: none"> ▪ Take inventory of the technology sector assets and expertise that will be made available to organizations, youth and children in the community (i.e. tools, testbeds, services, opportunities) ▪ Leverage the existing network of community child and youth programs, services and technology experts as important community delivery partners ▪ Develop or enable new program and service offerings only to fill gaps in the community and to address unmet needs of children and youth across all ages and groups
	<p>Change management: Project Management (Ch 8)</p>

Risk category	Risk, risk definition, mitigation
	<p>The risk that the organization will not adapt effectively to new strategic changes within the organization.</p> <p>Mitigation activities:</p> <ul style="list-style-type: none"> ▪ Develop a framework to annually assess the effectiveness of existing programs, partnerships and networks including gap analysis and measurement against organizational objectives ▪ Encourage idea generation from the community to identify new and unmet needs or opportunities ▪ Work with the Advisory Committee to determine the strategic rollout and allocation of funding to current and new initiatives in order to effectively meet SWR objectives ▪ Develop a culture of responsiveness and resilience within the SWR ▪ Clearly articulate – with delivery partners, firms and service organizations – the requirements to continually assess and adapt to the needs of the community's children and youth
IT and Operations	<p>Measurement and monitoring: Performance Measurement (Ch 6)</p> <p>The risk that the organization does not measure and/or monitor performance of programs against desired outcomes and needs of the community.</p> <p>Mitigation activities:</p> <ul style="list-style-type: none"> ▪ SWR will use a Developmental Evaluation approach to assess the responsiveness of SWR to the needs of Waterloo Region, and to monitor the strides being made as SWR progresses ▪ The Performance Measurement Plan will be evaluated every 6 months by the DSPC
IT and Operations	<p>IT infrastructure: Data Privacy and Security (Ch 5)</p> <p>The risk that IT infrastructure does not align with business requirements and does not support availability, access, integrity and security of data (re: business continuity and inappropriately disclosed information.)</p> <p>Mitigation activities:</p> <ul style="list-style-type: none"> ▪ Refer to Table 4.3.1 Data Security & Privacy Considerations for mitigation activities for IT Infrastructure

Risk category	Risk, risk definition, mitigation
Public image	<p>Stakeholder relationship management: Engagement (Ch 3), Project Management (Ch 8)</p> <p>The risk that the organization does not establish and effectively manage relationships with key stakeholder groups (i.e., community groups, government, youth, families).</p> <p>Mitigation activities:</p> <ul style="list-style-type: none"> <li>▪ Establish formal relationship agreements with the SWR and its Advisory Committee to select, engage, and work with appropriate partners – this will include relationships with community groups (including children and youth), companies, service delivery partners, government. <li>▪ Develop a stakeholder management plan to frame clear messaging and responsibilities for key organizational management, Advisory Committee and other committee members <li>▪ Hire and equip personnel with adequate reputation/media training to establish, maintain or represent the organization's mission, vision and brand with relevant stakeholders, the public, children and youth <li>▪ Engage in a customer segmentation exercise to identify market/customer/stakeholder segment, needs, gaps and relevant communications requirements <li>▪ Enable customer relationship management strategies, technologies and personnel to manage and maintain robust relationships with children, youth, the community and partners
Public image	<p>Funding relationship management: Financial (10)</p> <p>The risk that the organization does not establish and effectively manage relationships with its funding partners.</p> <p>Mitigation activities:</p> <ul style="list-style-type: none"> <li>▪ Establish a MOU or Contracts with funding partners that outlines funding parameters over implementation period <li>▪ Reporting strategies established to normalize project updates relating to funding from partners <li>▪ Annual review meetings with funding partners and forward planning meetings to adjust funding flow or project activities
Public image	<p>Reputation, public and media relations: Project Management (Ch 8)</p>

Risk category	Risk, risk definition, mitigation
	<p>The risk that the organization is not able to effectively manage its brand and reputation across media channels (e.g., press releases, internet, social media).</p> <p>Mitigation activities:</p> <ul style="list-style-type: none"> ▪ Develop and annually review communications and engagement plan targeted at public, stakeholders, and youth ▪ Communications plan will include strategies and activities to build brand/reputation ▪ Establish SWR response plan for inquiries from media including identification of key SWR implementation team or Advisory Committee members
Human resources	<p>Recruitment of management and staff: Governance (Ch 7)</p> <p>The risk that the organization is not able to attract and retain the necessary resources to effectively manage programs, operations and to deliver on its mandate and achieve objectives.</p> <p>Mitigation activities:</p> <ul style="list-style-type: none"> ▪ SWR will work in consultation with the Region of Waterloo's HR Department and industry experts to recruit and retain employees with the skills and experiences necessary ▪ SWR will offer competitive compensation to employees and provide ongoing professional development
Human resources	<p>Retention of management and staff: Governance (Ch 7)</p> <p>The risk that the organization is unable to retain the necessary resources to effectively manage programs, operations and to deliver on its mandate and achieve its objectives.</p> <p>Mitigation activities:</p> <ul style="list-style-type: none"> ▪ Capacity building and training opportunities for staff to support continuous development ▪ Integration of Region's values and ethics into operations
Financial	<p>Financial recording and reporting: Finance (Ch 10)</p>

Risk category	Risk, risk definition, mitigation
	<p>The risk that financial transactions are not properly processed, reviewed, reported and disclosed to ensure that there are no errors or omissions to financial reporting.</p> <p>Mitigation Activities:</p> <ul style="list-style-type: none"> ▪ Class A estimates will be completed prior to the issuing of Requests for Proposals or establishing partnership agreements ▪ The Region's team of Procurement, Financial and Legal professionals will be available to assist the Executive Director, Procurement and Financial Manager, and Advisory Committee on procurement and cash flow issues. Delays in completion and substandard performance will be addressed through the contracts that are established for the performance of the work including potential penalties for non-performance or delays ▪ The Region's vendor performance program will be leveraged to ensure that non-performing vendors do not get subsequent work on the Smart Cities project. ▪ Cash flow issues will be mitigated by arrangements with the Region of Waterloo for temporary financing
Legal and compliance	<p>Fraud, misappropriation and theft: Implementation and Risks (9)</p> <p>The risk that the organization is susceptible to fraud, misappropriation and theft perpetrated by employees or external parties.</p> <p>Mitigation activities:</p> <ul style="list-style-type: none"> ▪ Annual reporting to Region of Waterloo Council on status of implementation ▪ Annual 3rd party audits of finances (Region currently uses KPMG LLP for annual audits) ▪ Regional review and intervention in operations and implementation of project
Legal and compliance	<p>Government agreements: Privacy Data and Security (Ch 5); Implementation and Risk (Ch 9)</p>

Risk category	Risk, risk definition, mitigation
Legal and compliance	<p>The risk of not complying with agreements set out with the government, including restrictions on use of government funding.</p> <p>Mitigation activities:</p> <ul style="list-style-type: none"> ▪ The DSPC will complete a PPIA for each solution identified in Chapter 4, which will ensure compliance with relevant privacy legislation ▪ Additional details regarding PPIA completed as part of Phase 2 can be found in Appendix C- Confidential Annex ▪ The Region of Waterloo completed an assessment of the Crown's duty to consult ▪ The Region's team of Procurement, Financial and Legal professionals will be available to assist the Executive Director and Advisory Committee on compliance with agreements set out with the government, including restrictions on use of government funding
	<p>Privacy and confidentiality: Privacy Data and Security (Ch 5)</p> <p>The risk that the privacy and confidentiality of personal information and/or sensitive health or personal data is compromised.</p> <p>Mitigation activities:</p> <ul style="list-style-type: none"> ▪ The DSPC will complete a Privacy Impact Assessment and Threat Risk Assessment for implementation and conduct ongoing privacy and security checks ▪ Development and signing of a Memorandum of Understanding (MOU) outlining data and privacy requirements for all project participants and/or vendors ▪ Ongoing adherence to all Privacy by Design Principles ▪ Development and implementation of an Enterprise Risk Management framework for proactive management and monitoring of cyber security threats ▪ Additional details regarding PPIA completed as part of Phase 2 can be found in Appendix C- Confidential Annex <p>Safety: Technology- and Data-Enabled Solutions; Implementation (Ch 4)</p>

Risk category	Risk, risk definition, mitigation
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The risk that delivery of services/programs may result in adverse and/or unforeseen outcomes to children/youth.

Mitigation activities:

- Prior to implementation of each project, a preliminary impact and risk assessment will be completed to ensure activities contribute to SWR outcomes
- Appropriate liability and insurance requirements will be built into partnership agreements
- A Threat Risk Assessment will be completed prior to each project to assess for unforeseen outcomes to children and youth

9.2.1. Quarterly Assessment

Quarterly, the SWR Implementation Team will review each of the dimensions, and assess their likelihood of occurrence as well as the potential impact of each risk, should it be left unaddressed. Management will use the quarterly assessment to advise the Advisory Committee as to which risks are most in need of monitoring vs. immediate action, along with the details of any recommended risk mitigation activities.

Risk Assessment Tool

Level	Likelihood		Impact	
	Potential	Description	Potential	Description situation or condition
1	Almost Certain	Expected to occur, several times, within the year (90%+)	Severe	Extreme: permanent or long-term damage to the organization's ability to achieve objectives. Front-page news for an extended period.
2	Likely	Will occur one or more times, within the year (41-89%)	Major	Endurable: with the proper management, the organization can endure in achieving objective. Front-page news for a short time.
3	Possible	Should occur at some point, within a year (21 – 40%)	Moderate	Effort: management effort is required to minimize impact at achieving objectives. Moderate to negative attention.
4	Not likely	Could occur at some point, within the year (5 – 20%)	Minor	Managed: managed under normal circumstances as organization is achieving objectives. Short-lived attention.
5	Remote	May occur, exceptional circumstances, within the year (<5%)	Negligible	Absorbed: absorbed through normal activities as organization is achieving objectives. No attention.

The Advisory Committee will monitor variances in the level of risk and determine its level of comfort with the risk management plan. It will also assume responsibility for the fulfilment of the obligations and responsibilities outlined in the contribution agreement with the Infrastructure Canada including all financial responsibilities of the organization.

10. Financial

10.1. Phase 2 Summary

Phase 2 activities were supported by a \$250K grant from Infrastructure Canada, and leveraged 3:1 (\$750K) by other funding and in-kind support. The Region of Waterloo and the seven area municipalities matched the grant with a contribution of with \$250K. Additional in-kind support from the Region of Waterloo, area municipalities and community partners included: staff, communications support, community engagement assistance and advisory services. The Phase 2 work plan and preliminary project budget (grant funds and matching) were outlined in a public report to the Region of Waterloo Council in the summer of 2018.

Over \$200K of Phase 2 funding was used for community engagement. This work was vital. It has informed the development of priorities, measurement requirements, and the development of technology and data-enabled solutions identified in this application. Costs included retention of a human-centred design consultant, with extensive experience in working with children and youth, to develop and facilitate Phase 2 engagement, connect insights to action, and scope future engagement needs (Chapter 3).

The remaining \$50K of *Smart Cities Challenge* Phase 2 funding, was used to design and launch a community awareness campaign to encourage citizens to participate in the *Smart Cities Challenge*, and administer the development of the final application.

Matching contributions from the Region of Waterloo and area municipalities were allocated to staffing for Phase 2 projects (including engagement, community awareness, project management, and technology- and data-enabled solutions), SWR application development, administrative/legal support and partner relationships development.

10.2. Contributions from Other Sources

SWR has received overwhelming support from the community with cash and in-kind pledges totalling over \$100M. It is an amazing testament to the belief Waterloo Region and the nation have in this project, in creating better futures for Canada's young people.

Summary of Cash and In-Kind Support	
Third Party Support (Program/Service Delivery, Technology Development, Infrastructure, Outreach)	17,674,900
Applicant Support (Region and Area Municipalities)	60,860,000
Lyle S. Hallman Foundation and the Astley Family Foundation	26,400,000
Total	\$104,934,900

NOTE: SWR has expressions of interest from Ontario, British Columbia, Alberta, Quebec, Manitoba, Nova Scotia, and Nunavut to aid in scaling SWR solutions in other communities. Funds are not committed and, as such, are not included in the SWR initiative as scoped in this document. Scaling partners will help to bring these solutions to other communities. \$200K has been allotted to SWR to support working with other communities to scale solutions.

10.3. Financial Considerations

SWR is a \$155M project. From the ground up with support to programs working directly with families, and from the top down with multidisciplinary research to understand the nature of well-being, the scope of SWR activity is intended to reach deeply and widely into the community to enhance child and youth well-being for as many residents as possible. As such, this is an initiative with many sub-projects and a variety of sources of funding.

SWR has tried to present financial information in a clear, simple format. If additional cost information on a project-by-project basis is required, SWR is happy to work with Infrastructure Canada to expound on budgets and expenditures. For a detailed breakdown of expenditures, please refer to Appendix A.

Large projects are not without risks including procurement issues, delays in completion, cash flow issues and substandard performance/deliverables by contractors. The Region's team of Procurement, Financial and Legal professionals would be available to assist the Advisory Committee on such matters. Delays in completion and substandard performance could be addressed through the contracts that are established for the performance of the work including potential penalties for non-performance or delays. A vendor performance program could be utilized to ensure that non-performing vendors do not get subsequent work on the Smart Cities project. Cash flow issues could be mitigated by arrangements with the Region of Waterloo for temporary financing.

10.4. Sustainability

Projects outlined in this proposal are focused on enhancements that do not require ongoing financial support. Expenses are predominantly at the front end of each project and are associated with the creation, adoption or implementation of technology or data-enabled solutions, programs or supports. Implementation will occur over the five-year funding period.

In Waterloo Region

Community partner organizations – school boards, municipalities, the 70 member organizations of the Children and Youth Planning Table – are established and funded. They form the delivery network for solutions implemented through the SWR initiative. Subsequent solution use and management will be normalized as part of the infrastructure of existing community partner operations, ensuring long-term delivery past the five-year *Smart Cities Challenge* funding period.

Local philanthropic organizations like the [Lyle S. Hallman Foundation](#) and the [Astley Foundation](#) are already investing in existing SWR projects and will provide future funding for child and youth well-being projects beyond 2024. To support SWR projects over the next five years, each organization has allocated new cash allocations totalling \$26.4M (\$26M from Lyle S. Hallman Foundation, \$400K from Astley Foundation).

Infrastructure-related projects with long-term impact (e.g., installation of fibre networks) are one-time costs. These will provide benefits to children and youth in the community long after the funding period. SWR will not cover ongoing fees related to licensing and usage which will normally be covered by the Region and/or municipalities.

The Region of Waterloo and area municipalities are committed to ongoing alignment of \$12M per annum toward child and youth programming that supports SWR. This will include delivery of programs and services through connected community spaces. Annual funding from the municipalities is not contingent upon Federal funding through the *Smart Cities Challenge*, and will continue post 2024.

[HIP Developments](#) and [LAUNCH](#) will host the COE – rent-free, for 20 years – in a new build in the heart of the City of Waterloo. The COE will be located in the LAUNCH space: a 40,000 square-foot, five-floor facility dedicated to STEAM culture for kids. This generous contributions, valued at over \$5M will ensure long-term sustainability of the Centre and its support for programming, research and technology development.

10.5. Financial Tools, Controls and Accounting Methodologies

The Region of Waterloo is a municipal government with a \$1.5 billion annual operating and capital budget. The SWR project will leverage the Region's extensive experience in stewarding public funds and reporting on annual operations and capital projects, including major infrastructure projects such as Light Rail Transit. SWR operations and processes

will be overseen and approved as required by the Advisory Committee with assistance from the Region's Finance team.

The Region utilizes fund accounting for the purpose of distinguishing restricted funding from general funding. As such, all financial information for SWR can be segregated and reported separately from financial activity for the Region of Waterloo. Related expense activity will be mapped based on prescribed eligibility criteria and funds received pursuant to an agreement in support of this project will be held in a separate account. All disbursements from the Smart Cities funding account will reconcile with eligible Smart Cities expenses.

Financial reporting will be provided to Infrastructure Canada as required by a contribution agreement and/or disbursement schedule. The Region's financial statements are audited annually by KPMG LLP and a separate audit for Smart Cities project funding will be supplied upon request.

Financial Controls

During development and implementation, each project will track expenditures, time, and changes (Agile framework). Financial performance will be measured – on a project-by-project basis and for the overall initiative – using an Earned-Value Management (EVM) system to accurately measure planned versus actual spend. EVM will provide the necessary measurement control to accurately determine cost and schedule variances, and schedule and cost performance indices.

Project expenditures and performance analyses will be provided to the Advisory Committee on a quarterly basis to inform risk management reviews (Chapter 5). An annual report will be released publicly by Q2 each year. It will update Regional Council and the community on the status of implementation and expenditures.

10.5.1. Project Estimates

The budget supplied is based on the initial project scoping for the purposes of this application. Costs may change subsequent to the development of a full Scope of Work and RFP process for each project.

Technology and data-enabled solutions are outlined in Chapter 4. Estimates for these projects are based on information supplied by technology companies, and actual costs incurred by municipalities or child and youth service delivery providers. Costs to scale pilot projects run in Phase 2, and community partner projects slated for scale are based on existing financial data.

Costs for Administration, Community Engagement and Community Awareness were developed based on staffing estimates at the municipal level, actual costs for Phase 2 engagement activities, and actual costs for campaigns carried out by community partners.

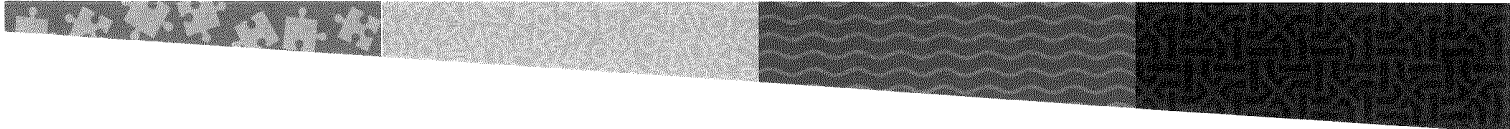
Timing assumptions:

- Annual Start Date - Q4 2019 - Q4 2020
- Contribution Agreement Start Date - Q4 2019
- Contribution Agreement End Date - Q4 2024

The Region of Waterloo requests an advance of 50% of yearly funding in Year 1 and Year 2, in order to support swift scaling of piloting and proven projects. Please see the end of this section for budget information. Note: Budgets are provided on legal-sized pages.

Procurement Controls

Each project within the implementation phase (see Chapter 4) has an allocated budget (Chapter 10) and will require Class A estimates prior to execution. Scaling projects have identified implementation delivery partners, however New and Pilot projects will require a complete Request For Proposal (RFP) process to identify vendors. All RFPs will be



posted via an open, public process and will specify requirements for timing, deployment, ownership, and privacy of data collected or used in the technology and data-enabled solution. (See Chapter 5 for details)

Community partners (e.g., Communitech, researchers, youth) will help define the Scope of Work (SOW) for each technology and data-enabled solution. This process will help ensure that the right technologies are developed, customized and adopted. Community input will a) inform the development of each RFP, b) help identify the child and youth services delivery partner(s) who will be responsible for delivering each solution and c) help identify the resources required to deliver the solution. Projects must:

- Align against outcomes for SWR projects
- Engage multiple players (more than two)
- Foster partnerships across child and youth-serving, private, public, academic, and research organizations
- Adhere to data requirements as outlined in Chapters 4 and 5

**Page(s) 678 to 681
are withheld
pursuant to paragraph
13(1)(d) and 20(1)(b)
of the *Access to Information Act***

**La/les page(s) 678 à 681
Font l'objet d'une exception totale
conformément aux dispositions de paragraphe
13(1)(d) and 20(1)(b)
de la *loi sur l'accès à l'information***

Alt-text and Long Text Descriptions

Page 6

- Table description:
 - Table describes Smart Waterloo Region areas of focus, including: early childhood development, literacy, mental and emotional health and sense of belonging.

Page 8

- Table description:
 - Table describes checklist of learnings that have served and will serve as touchstones for Smart Waterloo Region.

Page 9

- Image description:
 - Design thinking process image showing problem definition, research, ideation, prototyping, and testing.

Page 12

- Image description:
 - Root cause and area of focus map depicting eight root causes of focus, narrowed to four root causes, and four areas of focus, including: early childhood development, literacy, mental and emotional health and sense of belonging.

Page 15

- Table description:
 - Table describes engagement tools used and events hosted during the Phase 2 engagement process.

Page 23

- Table description:
 - Table describes data collaborative security and privacy specifications

Page 25

- Table description:

- Table describes technology and data-enabled solutions and summarizes the proposed solutions that will help SWR and community partners respond to the needs identified by stakeholders in the engagement process.

Page 44

- Image description
 - Image is a visual representation of engagement, naming specific groups in the shape of SWR.

Page 45

- Image description
 - Image is a high-level summary of the logic model Smart Waterloo Region will use to map immediate, intermediate and long-term outcomes.

Page 46

- Table description
 - Table outlines the long-term outcomes and associated performance indicators which have been selected as key determinants of success for local child and youth well-being.

Page 47

- Image description
 - Image describes the organization structure of the Smart Waterloo Region implementation team and three supporting committees.

Page 49

- Table description
 - Table describes Smart Waterloo Region Implementation team roles and responsibilities.

Page 50

- Table description
 - Table describes overview of Smart Waterloo Region partners, project codes and the various roles of partners connected to their associated projects.

Page 53

- Table description

- Table describes initial implementation and operational timeline.

Page 55

- Table description
 - Table summaries project summary costs for the implementation period from 2019 through to 2024, with total project costs and total grant expenditure.

Page 67

- Table description
 - Table summarizes level, likelihood and impact of potential risk, with description of situation or condition.

Page 68

- Table description
 - Table describes a summary if cash an in-kind support from partners and contributors.

Page 72

- Table description
 - Table summarizes project, administrative and community outreach costs over the five year implementation timeline.

SmartWR pitch video text

We do things differently in Waterloo Region.

Some say it comes from our barn-raising roots. From a time when neighbours came together to help neighbours.

This collaborative spirit holds strong today....whether we are called upon to help neighbours...or newcomers.

We have a reputation for solving problems collectively here. For knocking down silos and working across sectors.

Despite the success story of Waterloo Region, some big problems remain...

- Our high school graduation rates are below the national average.
- Almost one in three children are vulnerable to learning difficulties.
- 1 in five youth in Waterloo Region don't feel connected to their community.

This is not what we want for our children and youth in Waterloo Region.

What do we want?

We want to continue to find innovative solutions to problems facing young people. This means working **with** children and youth in new ways and placing them at the centre.

It means engaging younger people, especially those whose voices maybe have been overlooked in the past.

It means looking at old problems and finding new solutions with local...regional...provincial...and national...partners.

And that's exactly what we're doing.

We will become the best community in Canada for children and youth.

By creating new partnerships between tech, social, education, government and private sectors.

By collaborating with UNICEF to learn from and share data in ways that will improve the lives of young people.

By asking children and youth what's important to **them**, to better understand the barriers and challenges **they** face.

We will innovate by:

- Using tech and data to connect community spaces across our urban, rural, and indigenous communities.
- Working with organizations to help young people access health and mental health supports faster.
- Using tech in schools and other spaces to build resiliency and emotional awareness in kids.

With a history of coming together...doing things differently... lending a hand to those who need it...we're ready for a new barn-raising mentality.

Our partners, our residents, our children and youth are ready to transform Waterloo Region into the best community in Canada for kids. Join us!



Appendix A

Supporting Material

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Appendix A.

1. Acronyms

ADA	Aggregated Dissemination Area
AI	Artificial Intelligence
AODA	Accessibility for Ontarians with Disabilities Act
API	Application Programming Interface
APP	Application
BEP	Business and Education Partnership
CCHS	Canadian Community Health Survey
CFCI	Child Friendly Cities Initiative
CHEO	Children's Hospital of Eastern Ontario
CIW	Canadian Index of Wellbeing
CMA	Census Metropolitan Area
COE	Centre of Excellence for Child and Youth Well-being
CY-Index	Canadian Index of Child and Youth Well-being
CYPT	Children and Youth Planning Table of Waterloo Region
DSBN	District School Board of Niagara
DSPC	Smart Waterloo Region Data Security and Privacy Committee
EDI	Early Development Instrument
EQAO	Education Quality and Accountability Office
FIPPA	Freedom of Information and Protection of Privacy Act
FTE	Full Time Equivalent
IP	Intellectual Property
IPC	Information and Privacy Commissioner of Ontario
KPS	Kindergarten Parent Survey
LMS	Learning Management System
MDI	Middle Years Development Instrument
MFIPPA	Municipal Freedom of Information and Protection of Privacy Act
ML	Machine Learning
MOU	Memorandum of Understanding
OSSLT	Ontario Secondary School Literacy Test
OTF	Ontario Trillium Foundation

Appendix A.

PHIPA	Personal Health Information Protection Act
PI	Personal Information
PIA	Privacy Impact Assessment
PPIA	Preliminary Privacy Impact Assessment
RCYW	Rural Child and Youth Wellbeing
RFP	Request for Proposals
SDG	Sustainable Development Goal
SNS	Special Needs Strategy Planning Table
SSID	Service Set Identifier
SSL	Secure Sockets Layer
STEAM	Science, Technology, Engineering, Arts and Math
SWR	Smart Waterloo Region
TOR	Terms of Reference
TRA	Threat Risk Assessment
UNICEF Canada	United Nations International Children's Emergency Fund Canada
UW	University of Waterloo
VAC	Volunteer Action Centre
VDI	Virtual Desktop Infrastructure
VPN	Virtual Private Network
WCDSB	Waterloo Catholic District School Board
WLU	Wilfrid Laurier University
WRDSB	Waterloo Region District School Board
WWLHIN	Waterloo Wellington Local Health Integration Network
WWR	Wellbeing Waterloo Region
YDI	Youth Development Instrument
YMCA CKW	YMCA of Cambridge and Kitchener-Waterloo

Appendix A.

2. Key Definitions

Caring Adult: Any adult who has a meaningful relationship with a child and/or youth (e.g., parent or other relative, teacher, youth worker, neighbour, etc.).

Children and youth: prenatal to 18-ish, and their families. 18-ish is in recognition that some youth will exit the school system before, and some after the age of 18.

Literacy: When we talk about literacy related to child and youth well-being, we are talking about the ability to read and write at an age-appropriate level from early childhood up to age 18.

Mental/emotional health: When we talk about child and youth emotional/mental health, we are talking about the following as it pertains to age-appropriate expectations from early childhood up to age 18:

- effective coping and problem-solving skills to navigate life challenges
- emotional intelligence
- self-regulation
- a strong sense of self-worth and identity
- healthy relationships with peers

Root cause: A *root cause* is that portion of a system that, at the fundamental level, explains why the system's natural behavior produces the problem symptoms rather than some other behavior. It is the deepest cause in a causal chain that can be resolved.

Sense of belonging: When we talk about sense of belonging for children and youth, we are talking about children and youth feeling valued, heard and included, specifically:

- feeling that they have a voice
- feeling welcomed and that they belong
- feeling that they are valued members of community
- having opportunities to participate and contribute
- being seen as capable

Well-being: SWR has adopted the UNICEF definition of child and youth well-being as expressed by the UNICEF Report Card, 2007: The true measure of a nation's standing is how well it attends to its children – their health and safety, their material security, their education and socialization, and their sense of being loved, valued, and included in the families and societies into which they are born.

Early childhood development: When we talk about early childhood development, we are talking about development from conception to age six in any of the following areas:

- physical health and well-being
- social competence
- emotional maturity
- language and cognitive development
- communication skills and general knowledge

Appendix A.

3. Evidence: Citations

Source	Notes
Children and Youth Planning Table Waterloo Region (n.d.). <i>A snapshot of child and youth wellbeing in Waterloo Region</i> . Waterloo Region, ON: CYPT. Retrieved from https://childrenandyouthplanningtable.ca/wp-content/uploads/2018/03/Snapshot-of-Child-and-Youth-Wellbeing-Report-access.pdf	32 system-level indicators of child and youth wellbeing in Waterloo Region with Provincial comparisons where available
Canadian Index of Wellbeing(2016). <i>How are Canadians really doing? The 2016 CIW national report</i> . Waterloo, ON: Canadian Index of Wellbeing. Retrieved from https://uwaterloo.ca/canadian-index-wellbeing/sites/ca.canadian-index-wellbeing/files/uploads/files/c011676-nationalreport-ciw_final-s.pdf	A look at well-being in general in Waterloo Region across 8 domains with Provincial comparisons
Wellbeing Waterloo Region (2018). <i>WWR Community Consultations (raw data)</i> . Waterloo Region, ON.	Review of all raw data collected through the WWR community consultation process related to children and youth
Wellbeing Waterloo Region (2017). <i>Measuring and Monitoring Wellbeing in Waterloo Region: Results of Partner Agency Wellbeing Survey</i> . Waterloo Region, ON: WWR.	A look at wellbeing of targeted groups, including youth, in Waterloo Region across 8 domains with Provincial comparisons
Smart Waterloo Region (2017-2018). <i>Smart Cities Phase 1 Community Consultations</i> . Waterloo Region, ON: SWR	Review of all raw data collected through the Smart Cities community consultation process related to children and youth
Smart Waterloo Region. (2018) <i>Smart Cities Application: Healthy Children and Youth</i> . Waterloo, ON: Region of Waterloo. Retrieved from: https://www.regionofwaterloo.ca/en/resources/smart_waterloo_region_accessible_application.pdf	Includes Phase 1 research and data related to the 6 Areas of Focus
UNICEF Canada (2018). <i>One Youth</i> . Retrieved from: https://oneyouth.unicef.ca/en	National look at child and youth wellbeing with comparison to other "wealthy" countries
Kholer, L. (2018). <i>Youth and Young Adult Wellbeing Assessment North Dumfries, Wellesley, Wilmot, and Woolwich Townships</i> . St. Jacobs, ON: Woolwich Community Health Centre, Wellesley Township Community Health Centre. Retrieved from: http://spccnd.org/userContent/documents/Youth%20and%20Young%20Adult%20Needs%20Assessment%202018%20Final.pdf	Data from youth living in one of the four townships related to the CYPT 6 Shared Goals for Child and Youth Wellbeing

Appendix A.

Source	Notes
Region of Waterloo Public Health & Emergency Services (2017). Perceptions of Youth Health in Waterloo Region: A Report on Findings from Focus Groups Conducted with Youth. Waterloo, ON. Retrieved from: https://www.regionofwaterloo.ca/en/regional-government/resources/Reports-Plans--Data/Public-Health-and-Emergency-Services/YOUTH_REPORT_2017.pdf	A look at input from local youth regarding their risk-taking behaviours related to issues of wellbeing
Boak, A., Hamilton, H.A., Adlaf, E. M., Henderson, J.L., & Mann, R.E. (2016). <i>The mental health and wellbeing of ontario students, 1991-2015: Detailed OSDUHS findings</i> (CAMH Research Document series No. 43). Toronto, ON: Centre for Addictions and Mental Health. Retrieved from: https://www.camh.ca/-/media/files/pdf---osduhs/the-mental-health-and-well-being-of-ontario-students-1991-2015---detailed-osduhs-findings.pdf?la=en&hash=59BFD5B17408AAEE0E837E01048088ED51E558B2	A look at local (Waterloo and Wellington regions) data from youth related to bullying experiences
WorldVuze (2017, November). Consultation with youth for the Children and Youth Planning Table (raw data). Waterloo Region, ON.	Input from youth of varying ages across Waterloo Region regarding the 6 Shared Goals for Child and Youth Wellbeing
Ontario Early Years Child and Family Centre (2017). <i>Planning consultation with parents: Survey</i> . Waterloo Region, ON: Children's Services, Region of Waterloo. Ontario Early Years Child and Family Centre (2017). <i>Planning consultation with parents: In-person consultation</i> . Waterloo Region, ON: Children's Services, Region of Waterloo.	Input from parents across Waterloo Region regarding the importance of the 6 Shared Goals for Child and Youth Wellbeing
Holliday, C. (2016). <i>A Community Fit for Children: A Focus on Young Children in Waterloo Region</i> (3rd ed.). Waterloo Region, ON: Children's Services, Region of Waterloo. Retrieved from: http://www.earlyyearsinfo.ca/uploads/2/1/4/6/21464250/community_fit_2016.pdf	Comprehensive information related to the wellbeing of young children and families in Waterloo Region (particularly the EDI and KPS)
Lothian, S. (2018, May 14) Halton's Our Kids Network – Focus on EDI. Phone Interview.	Phone interview
Brown, S. (2018, May 28) City of Prince George, BC – Focus on Sense of Belonging. Phone Interview	Phone interview

Appendix A.

Source	Notes
Smith, C. & Archer, J. (2018, May 14). City of London's Child and Youth Network – Focus on Literacy. Phone Interview.	Phone interview
City of Ottawa (2018, June 25). Ottawa Child and Youth Initiative: Growing up Great – Focus on Mental Health. Phone Interview.	Phone interview
Beiles, B. (2018, May 28) The County Community Foundation (Prince Edward County) – Focus on High School Graduation. Phone Interview.	Phone interview
O'Gorman, M. (2018-2019). Personal Communications. Waterloo Region, ON. More information from: https://uwaterloo.ca/english/people-profiles/marcel-ogorman	Applied Media Theory research - including conscientious use of smart technology.
Children and Youth Planning Table (2018) CYPT Collective Impact Recommendation Working Group Final Recommendation. Retrieved from https://childrenandyouthplanningtable.ca/wp-content/uploads/2018/12/DOCS_ADMIN-2812089-v1-CYPT_Collective_Impact_Recommendation_WG_-_Final_Recommendation.pdf CYPT Collective Impact Recommendation	Research work by child and youth-serving experts related to 6 areas of potential focus.
Morin, A. (2017, November 3). 10 Reasons teens have so much anxiety today. <i>Psychology Today</i> . Retrieved from: https://www.psychologytoday.com/us/blog/what-mentally-strong-people-dont-do/201711/10-reasons-teens-have-so-much-anxiety-today	Top issues related to youth anxiety.
De Angelis, R. (2019, February 6). Students to get a say on health care issues and policy in Waterloo region and Guelph. <i>CBC News</i> . Retrieved from: https://www.cbc.ca/news/canada/kitchener-waterloo/waterloo-wellington-lhin-student-health-advisory-committee-1.5008236	Students in Waterloo Region and Guelph sharing their experiences and thoughts on health care.
Canadian Public Health Association (2003). <i>Bullying, School Exclusion and Literacy: Discussion Paper</i> , Ottawa, ON: Human Resources Development Canada, National Literacy Secretariat. Retrieved from: https://www.cpha.ca/sites/default/files/uploads/resources/antibullying/discussion_paper_e.pdf	This discussion paper explores the potential correlation between the variables of bullying, literacy and school engagement in the Canadian youth population.

Appendix A.

Source	Notes
Montrol, J.J., Bowles, R.P., Skibbe, L.E., & Foster, T.D. (2014). Social skills and problem behaviours as mediators of the relationship between behavioural self-regulation and academic achievement. <i>Early Childhood Research Quarterly</i> , 29(3), 289-309. Retrieved from https://journals-scholarsportal-info.libproxy.wlu.ca/details/08852006/v29i0003/298_ssapbabbsaaa.xml#body-SEC0060	A study comparing low self-regulation skills and impulsive behaviour among children. The study notes that children who begin school with lower levels of self-regulation may, due to their limited ability to engage well with others, benefit less from classroom learning opportunities.
Benedict, F.T., Vivier, P.T. & Gjelsvik, A. (2015). Mental health and bullying in the United States among children aged 6 to 17 years. <i>Journal of Interpersonal Violence</i> 30(5), 782-795. Retrieved from https://journals-scholarsportal-info.libproxy.wlu.ca/pdf/08862605/v30i0005/782_m_habitca6t1y.xml	This article examines the association between mental health disorders and being identified as a bully among children between the ages of 6 and 17 years.
Underwood, M., Smith, A., & Ehrenreich, S. (2015). Bullying may be fueled by the desperate need to belong. <i>Theory Pract.</i> 53(4), 265-270. Retrieved from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4520317/	An article exploring bullying as a response to children and adolescent need to belong.
Theixos, H & Borgwald, K. (2013). Bullying the bully: Why zero-tolerance policies get a failing grade. <i>Journal of Social Influence</i> , 8(2-3), 149-160.	A review of zero-tolerance bullying practices and how this is a counterproductive approach to solving the bullying problem in schools and reinforced labels and environmental patterns that lead children and youth to bully. The article recommends an empathy and emotional skills building approach to motivate children and youth towards pro-social behaviour.
Nassem, E & Harris, A. (2015). Why do children bully?. <i>Social Leadership Today</i> 6(5). 68-73. Retrieved from: http://eprints.hud.ac.uk/id/eprint/24541/1/NaseemBully.pdf	An article outlining some of the common reasons children and youth engage in bullying behaviours.
Education Development Centre (EDC) Inc. (2013). <i>Eyes on Bullying in Early Childhood</i> . Waltham, MA: EDC Inc. Retrieved from: http://www.promoteprevent.org/sites/www.promoteprevent.org/files/resources/Eyes%20on%20Bullying%20in%20Early%20Childhood_1.pdf	An look at how bullying can begin in early years education and practical suggestions for early childhood educators and other adults.
National Scientific Council on the Developing Child (2011). <i>Children's Emotional Development Is Built into the Architecture of Their Brains: Working</i>	This article examines the scientific evidence around emotional development begins early in life, and is a critical aspect of the overall brain

Appendix A.

Source	Notes
<p>Paper 2. Retrieved from: https://developingchild.harvard.edu/wp-content/uploads/2004/04/Childrens-Emotional-Development-Is-Built-into-the-Architecture-of-Their-Brains.pdf</p>	<p>architecture- impacting the rest of someone's life. These findings have far-reaching implications for policymakers and parents, and, therefore, demand our attention</p>
<p>Saracho, O. (2016). Bullying prevention strategies in early childhood education. <i>Early Childhood Education Journal</i>. DOI: https://10.1007/s10643-016-0793-y</p>	<p>The importance of early childhood educators in identifying/distinguishing between bullying risk behaviours and the child's communication challenges; and modeling/teaching appropriate social and emotional skills to address the behaviours moving forward</p>
<p>Leiner, M., Dwivedi, A., Villanos, M., Singh, B., Blunk, D., & Peinado, J. (2014). Psychosocial profile of bullies, victims, and bully-victims: a cross-sectional study. <i>Frontiers in Pediatrics</i> 2(1). DOI: 10.3389/fped.2014.00001</p>	<p>This article aims to identify differences in the psychosocial profiles of adolescents who classified themselves as bullies, victims, or bully-victims through a cross-sectional study between 2009 and 2010.</p>
<p>Ready Nation. (n.d.). The Vital Link: Early Childhood Investment is the First Step to High School Graduation. New York, NY: ReadyNation Retrieved from: http://readynation.s3.amazonaws.com/wp-content/uploads/ReadyNation-Vital-Links-no-endnotes1.pdf</p>	<p>This resource connects the importance of investment in early childhood education and high school graduation.</p>
<p>Statistics Canada. (2008). <i>Early indicators of students at risk of dropping out of high school</i>. Ottawa, On: Statistics Canada. Retrieved from: https://www150.statcan.gc.ca/n1/pub/81-004-x/2004006/7781-eng.htm</p>	<p>This article summarizes the analysis of the Youth in Transition Survey that compared dropouts to high school continuers and graduates (considered as one group) on a range of characteristics at age 15</p>
<p>Reschly, A.L. (2010) Reading and school completion: Critical connections and matthew effects, <i>Reading & Writing Quarterly</i>, (26)1, 67-90. Retrieved from https://www.tandfonline.com/doi/pdf/10.1080/10573560903397023?needAccess=true</p>	<p>This article does a review of literature to argue that early reading interventions are a key to dropout prevention strategies. In general, data indicate that intensive early interventions positively affect students' reading skills, resulting in lower rates of grade retention, reduced incidence of placement in special education, and higher rates of high school completion.</p>
<p>Fiester, L. & Smith, R. (2010). <i>Early warning! Why reading by the end of third grade matters: A kids count special report from the Annie E. Casey foundation</i>. Retrieved from https://files.eric.ed.gov/fulltext/ED509795.pdf</p>	<p>A report put together by the Annie E. Casey foundation about the importance of reading proficiently by the end of grade 3. It outlines why it matters, factors that undermine grade-level reading proficiency, what America can do to solve the problem, a call to action, and indicators.</p>

Source	Notes
First Things First. (n.d.) Investing in early childhood. <i>Why Early Childhood Matters</i> . Arizona: First Things First. Retrieved from: https://www.firstthingsfirst.org/early-childhood-matters/investing-in-early-childhood/	Exploring the connecting between investing in early childhood education and future success in life.
Yoshikawa, H., Weiland, C. & Brooks-Gunn, J. (2016). When does preschool matter? <i>The Future of Children</i> 26(2), 21-35.	This article discusses the effectiveness of preschool education on language, literacy, and math skills, as well as the impacts on behaviour.
Platzman Weinstock, C. (2017). Depressed high school students more likely to drop out. Retrieved from: https://www.psychcongress.com/news/depressed-high-school-students-more-likely-drop-out	A study examining the association of past depression symptoms and high school dropout rates for youth.
Dupere, V., Dion, E., Nault-Briere, F., Archambault, I., Leventhal, T & Lesge, A. (2017). Revisiting the link between depression symptoms and high school dropout: timing of exposure matters. <i>Journal of Adolescent Health</i> 62(2), 205-211. DOI: https://doi.org/10.1016/j.jadohealth.2017.09.024	
Canadian Mental Health Association. (2019). Education. Canadian Mental Health Association (CMHA). Toronto, ON: CMHA. Retrieved from: https://cmha.ca/mental-health/finding-help/education	teenagers and young adults aged 15-24 experience the highest incidence of mental disorders of any age group in Canada. The school environment poses distinct challenges, but research and experience has shown that with understanding and co-operation on the part of administrators, teachers, parents and students, a young person's education does not have to be derailed by a mental illness or mental health problem.
Glogowski, K. (2015). What works in dropout prevention: Research evidence, Pathways to Education program design, and practitioner knowledge. <i>Pathways to Education Canada</i> . Retrieved from: https://www.pathwaystoeducation.ca/sites/default/files/editor_uploads/pdf/Mar2015_What_Works_Dropout_Prevention_EN.pdf	Pathways to education put together a report about best practices for dropout prevention, and effective interventions and approaches.
Lee, J. & Patton, J. (2017). The social exclusion of dually-involved youth: Towards a Sense of	From the social exclusion perspective, looks at how structural forces produce inequality to

Appendix A.

Source	Notes
Belonging. <i>The Journal of Sociology & Social Welfare</i> , 44(1), 41-64	acknowledge that not every youth is given the same opportunity for improved wellbeing.
Viner, R., Ozer, E., Denny, S., Marmot, M., Resnick, M., Fatusi, A & Currie, C. (2012). Adolescence and the social determinants of health. <i>The Lancet</i> , 379, 1641-1652	This article discusses how the health of adolescents is strongly affected by social factors at personal, family, community, and national levels.
Lips, A.M.B, O'Neil, R.R., & Eppel, E.A. (2011). Cross agency collaboration in New Zealand: An empirical study of information sharing practices, enablers and barriers in managing shared social outcomes. <i>International Journal of Public Administration</i> 34(4), 255-266. DOI: https://10.1080/01900692.2010.533571	This article explores New Zealand-based cross-agency information sharing practices, with a specific focus on information sharing enablers and barriers in multi-agency collaborative initiatives aimed at achieving integrated social service provision.
Dutton, D., Forest, P-G, Kneebone, R, & Zwicker, J. (2018). Effect of provincial spending on social services and health care on health outcomes in Canada: An observational longitudinal study. <i>CMAJ</i> , 190(3), E66-E71, DOI: https://doi.org/10.1503/cmaj.170132	This article aims to determine the association between spending on health care and social programs and health outcomes in Canada. It argues that "Conceptually, addressing the social determinants of health can be conceived as the equivalent of treating the root causes of disease and ill health"
Brennan Ramirez LK, Baker, E.A, & Metzler M., (2008). <i>Promoting Health Equity: A Resource to Help Communities Address Social Determinants of Health</i> , Atlanta, GA: Department of Health and Human Services, Centers for Disease Control and Prevention. Retrieved from: https://www.cdc.gov/nccdphp/dch/programs/healthycommunitiesprogram/tools/pdf/SDOH-workbook.pdf	A workbook is for public health practitioners and partners interested in addressing social determinants of health in order to promote health and achieve health equity.
World Health Organization. (2016). <i>Addressing the root causes of poor health and wellbeing in childhood and adolescence requires engaging sectors beyond health</i> . Retrieved from: https://childhub.org/en/child-protection-news/addressing-root-causes-poor-health-and-well-being-childhood-and-adolescence	An infographic encouraging working together to ensure health and wellbeing for all children and adolescents
Centre for Disease Control and Prevention. (2014). Frequently Asked Questions. <i>NCHHSTP Social Determinants of Health</i> . Atlanta, GA: CDC. Retrieved from: https://www.cdc.gov/nchhstp/socialdeterminants/frequently.html	Frequently asked questions about the social determinants of health

Appendix A.

Source	Notes
Camino, L. (2005). Pitfalls and promising practices of youth-adult partnerships: An evaluators reflections. <i>Journal of Community Psychology</i> , 33(1), 75-85.	An article outlining the common obstacles youth-adult partnerships face, and best practice suggestions adults and youth can implement to build stronger intergenerational opportunities.
Ho, E., Clarke, A. and Dougherty, I. (2015). Youth-led social change: topics, engagement types, organizational types, strategies, and impacts, <i>Futures</i> 67, 52-62. https://www.sciencedirect.com/science/article/pii/S0016328715000075	A review of strategies used by Canadian youth to achieve social goals.
Bolton, G. & Delderfield, R. (2018). Reflective practice: an introduction. In <i>Reflective Practice: Writing and Professional Development</i> (pp. 1-24), New York, NY: SAGE Publications Ltd	A chapter introducing readers to reflective practice, in particular the practice of reflexivity.
Khanna, N. & McCart, S. (2007). <i>Adult Allies in Action</i> . Toronto, ON: The Centre of Excellence for Youth Engagement. Retrieved from: https://studentscommission.ca/assets/pdf/en/publications/Adults_Alies_in_Action.pdf	A toolkit introducing Adult Allyship and best practices for when working with youth.
Dougherty, I. & Clarke, A. (2018). Wired for innovation: valuing the unique abilities of emerging adults, <i>Emerging Adulthood</i> 6(5), 358-365. Retrieved from: https://doi-org.libproxy.wlu.ca/10.1177%2F2167696817739393	This article outlines the unique life and developmental stage of young adults (age 15-25) and how this neurological capacity allows them to experience and excel in traits often associated with successful innovation.
Overlap Associates. (2018) <i>Session Output: Children and Youth Planning Table Problem Mapping Session</i> . Waterloo Region, ON: CYPT. Retrieved from: https://childrenandyouthplanningtable.ca/wp-content/uploads/2018/09/CYPT_Problem-Mapping-Report_Final.pdf	Research with youth, parents and service providers related to root causes related to the 6 areas of potential focus.
Ministry of Children and Family Development (2013), <i>Youth Engagement Toolkit Resource Guide</i> , Victoria, BC: Ministry of Children and Family Development. Retrieved from: https://www.ubcm.ca/assets/Services/Youth-Engagement/BC%20Minsitry%20-%20Resource%20Guide.pdf	A resource guide for youth engagement that provides in-depth information about youth engagement, as well as practical strategies for engaging youth.
Smart Cities Waterloo Region (SWR), (2018), <i>Youth Engagement Summary Report</i> , Waterloo Region, ON: SWR.	Various reports summarizing the input from Smart Waterloo Region engagement sessions with the community and youth. As well as reports summarizing input from the SCIC-YUH youth during advisory meetings.

Appendix A.

Source	Notes
SWR, (2018), <i>Smart Waterloo Region Launch Event: Event Capture and Insights Report</i> , Waterloo Region, ON: SWR.	
SWR, (2018), <i>Youth Problem Statement Feedback: Introduction to the Youth Advisory Council</i> , Waterloo Region, ON: SWR.	
SWR, (2018), <i>SCIC-YUH Meeting #2: What We Did</i> , Waterloo Region, ON: SWR.	
SWR, (2018), <i>SCIC-YUH Meeting #3: What We Did</i> , Waterloo Region, ON: SWR.	
Children and Youth Planning Table (CYPT), (2018), <i>Youth Engagement in Waterloo Region Survey Results</i> , Waterloo Region, ON: CYPT	Results from a survey sent out to Children and Youth Planning Table members on the current youth groups and engagement best practices happening in Waterloo Region among member organizations.
Apathy is Boring (2017), <i>Dear Municipalities, From Millennials</i> . Montreal, QC: Apathy is Boring & Laidlaw Foundation. Retrieved from: http://www.youthfriendly.com/uploads/3/1/3/9/31399973/municipal_youth_engagement_best_practices_report.pdf	A resources created by Millennials for municipalities with strategies and resources to encourage youth civic engagement.
Dougherty, I. (2011), Engaging youth in decision-making: moving from volunteerism to active citizenship, <i>The Philanthropist</i> 24(2),103-107. Retrieved from: https://thephilanthropist.ca/2011/11/engaging-youth-in-decision-making/	An article exploring the importance of getting youth involved to encourage long-term civic engagement, by providing opportunities for meaningful engagement.
Zeldin, S., Camino, L. & Mook, C. (2005). The adoptions of innovation in youth organizations: creating the conditions for youth-adult partnerships, <i>Journal of Community Psychology</i> 33(1), 121-135, https://doi.org/10.1002/jcop.20044	Through synthesis of theory, research, and field-based data, this article identifies 6 managerial guidelines for adopting and beginning to implement the innovation practice of youth-adult partnerships.
Zeldin, S., Petrokubi, J., McCart, S., Khanna, N., Collura, J. & Christens, B. (2011). Strategies for sustaining quality youth-adult partnerships in organizational decision making: multiple perspectives, <i>The Prevention Researcher</i> 18, 7-11. Retrieved from: https://sohe.wisc.edu/wordpress/wp-content/uploads/2014/05/TPR18-RI-Zeldin.pdf	Practical strategies and tips for implementing and maintaining effective youth-adult partnerships in organizational decision-making.

Appendix A.

Source	Notes
Dougherty, I. (2019, January). <i>Wired for Innovation: Understanding the unique abilities of young people</i> . Presentation at Children and Youth Planning Table January Meeting: Youth Engagement and Adult Allyship, Waterloo Region, ON.	Presentation to the Children and Youth Planning Table membership on the innovative role of young people in society and how we can better support meaningful youth involvement.
Children and Youth Planning Table (CYPT). (2019), Placemat results, <i>Children and Youth Planning Table (CYPT) January Meeting: Youth Engagement and Adult Allyship</i> , Waterloo Region, ON.	Input from Children and Youth Planning Table members on youth engagement and adult allyship from the January full membership meeting placemat activity.

Appendix A.

4. Oh Canada! Our Kids Deserve Better: UNICEF Report Card

Appendix A.



OH CANADA!

Our kids
deserve better.



Global Goal 12: Ensure sustainable production and consumption

Canada ranks
6



Global Goal 4: Ensure inclusive and equitable quality education for all

Canada ranks
8



Global Goal 8: Promote full and productive employment and decent work for all

Canada ranks
11



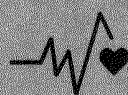
Global Goal 10: Reduce inequality within and among countries

Canada ranks
14



Global Goal 11: Make cities inclusive, safe, resilient and sustainable

Canada ranks
19



Global Goal 3: Ensure healthy lives and promote well-being

Canada ranks
29



Global Goal 1: End poverty in all its forms everywhere

Canada ranks
32



Global Goal 2: End hunger, achieve food security and improved nutrition

Canada ranks
37



Global Goal 16: Promote peaceful and inclusive societies

Canada ranks
37

UNICEF REPORT CARD 14
Canadian Companion

unicef.ca/irc14

CANADIAN COMPANION TO UNICEF REPORT CARD 14

Oh Canada! Our kids deserve better

Visit unicef.ca/irc14 for UNICEF Report Card 14, *Building our Future: Children and Sustainable Development Goals in Rich Countries*, infographics and background papers. Data sources and full references are cited in the Report Card.

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CAN CANADA BE THE BEST PLACE IN THE WORLD TO GROW UP?

A message from President and CEO, David Morley

The answer to this question is a resounding 'yes'. It must be, for the alternative is an unacceptable reality for too many of our children.

UNICEF Canada's report *Oh Canada! Our kids deserve better* focuses attention on an alarming pattern in our children's well-being that demands urgent attention. Over the past ten years, Canada's middle ranking among wealthy countries on UNICEF Indices measuring the state of children and youth has remained unchanged. More worrying are the widest gaps between Canada and the top performing nations that present themselves in child health, violence experienced by children and children's own sense of well-being. These gaps are symptoms of higher rates of poverty, social competition and stress, all of which affect children and can alter the trajectory of their lives.

We stand out among nations for many of the wrong reasons.

For too long, too many children have been living a life that doesn't measure up to the ideas held by Canadians across the country I've spoken to. Many think of Canada as a country of safety, of peace and of shared prosperity. We think our children are healthy and happy. This report shows us there is still a considerable distance to go for this to be true for all children in Canada.

We've seen improvements in many areas, but progress has slowed and Canada's children remain stuck in the middle among rich nations. Yet Canada has the innovation, capacity and resources to move the needle. So why isn't Canada already the best place in the world to grow up in? Why do we rank 25th out of 41 rich nations?

Oh Canada! Our kids deserve better distills the data into a comprehensive picture of childhood in Canada. It highlights the areas where we're performing well, where we're falling behind and where we must actively turn our attention.

It is only by better understanding the state of our children that we can begin to design solutions and direct smarter investments to see real progress in their lives.

There is no greater priority for any nation than the well-being of its children. It's up to all of us – individual Canadians, the private sector and all levels of government – to come together and ensure all of our children from coast to coast to coast are safe, healthy, educated and have dreams for their futures – dreams they can achieve.

Sincerely,



David Morley
President and CEO
UNICEF Canada

SUSTAINABLE CHILDHOODS

In September 2015, 193 nations, including Canada, came together to set universal targets for the world: the Sustainable Development Goals, or SDGs.

The Global SDGs are an ambitious global agenda. They not only aim to end extreme poverty and hunger by 2030, but are also designed to provide lifelong education for all, protect the planet, and promote peaceful and inclusive societies – and they include goals and targets to protect children from violence, combat climate change and reduce inequality. In achieving the Global Goals by 2030, we have the potential to grant every child a fair chance in life, ensuring them health, safety, education and empowerment.

The most telling sign of a nation's progress is the state of its children and youth – a sensitive indicator of the well-being of people, prosperity and the planet. The universal concept of child well-being is rooted in the Convention on the Rights of the Child (CRC), but the Agenda for Sustainable Development adds new dimensions, including reducing inequality and stemming climate change. Progress across all these dimensions will be vital to children's well-being around the world and in Canada. On the other side of the coin, a society cannot be inclusive and sustainable without prioritizing the well-being of its children and youth. UNICEF's league tables over the past decade have brought this into sharper focus: the best-performing countries for children also enjoy economic prosperity and pursue environmental sustainability. Canada is, in the minds of many, a big, clean, safe and healthy nation. But the data in this Report Card suggest it is not so very clean, safe or healthy for its children and youth.

UNICEF Report Card 14 measures rich countries according to the state of their children – including how equitably and sustainably they create the conditions for their well-being. It ranks the world's 41 high-income countries in league tables of their performance on each of 27 indicators of child and youth well-being, aligned to official targets for achievement of 10 of the 17 SDGs¹. Of the 27 indicators, Canada has data to report on 21². In a composite Index of Child and Youth Well-being and Sustainability,³ Canada is in a middle position at 25th place.

Canada does comparatively well in some aspects of child well-being and lags behind in others. All countries have areas for improvement; all rank in the middle or bottom third on at least two of the nine SDGs. A remarkably wide range of countries achieve the top rank in at least one of the 27 indicators. Generally, Canada's highest-ranking indicators relate to education and the somewhat softer impact of the Great Recession over the past decade on parental and youth employment in contrast to peer nations. It may surprise few that the Nordic countries are sustaining better, more equitable outcomes for children in more areas of their lives, but they are now joined by Germany and rising performers including Korea, Slovenia and Japan.

Four UNICEF Indices have measured and compared the state of Canada's children and youth from different angles over the past decade (see figure 6). The UNICEF Indices are not directly comparable as somewhat different indicators are used, but they reveal a pattern. Canada's middle ranking hasn't improved. Close to a third of our peer nations have advanced up the rankings, while almost half have moved down them, mostly related to the impact of the recent recession. Since the first Index in 2007, the United Kingdom has advanced eight places up the rankings, from 21st to 13th place. Our lack of movement up the Index should be of great concern. What can and should we be doing differently to improve the well-being of children and youth in Canada? Why isn't Canada one of the best places in the world to grow up?

When we look at the specific indicators that make up this most recent index, in Canada, 7 of the 21 indicators have improved and 8 have worsened (see figure 4). This is concerning because the trend over the past several decades has been improvement in the majority of well-being indicators. While that improvement was not significant enough to move us up the overall rankings compared to our peer nations, it was a change in the right direction. Worsening indicators should raise alarm bells. If our peer nations can achieve better outcomes for children and youth, so can we.

When we measure the “Possibility Gaps,” the distance between Canada’s outcomes and those of the best-performing nations for each indicator, there is a consistent pattern revealed by UNICEF’s Indices (see figure 5). The widest gaps are in child health, violence experienced by children, and children’s own sense of well-being. Recent evidence suggests that countries with poorer outcomes in these three areas typically have higher income inequality. Along with high income inequality come high rates of poverty, social competition and stress, which may contribute to these poorer outcomes for children and youth.⁴ They affect children broadly and make life more difficult for the poorest. Income inequality also sustains wider inequality among Canada’s children in other well-being outcomes, and it may help explain Canada’s lack of progress in the rankings.⁵

Many countries at the top of the league tables have high economic prosperity, but the high GDP of some lower in the rankings like USA and New Zealand shows that the economic wealth of a nation isn’t sufficient to lift child and youth well-being. It is the support at the family level that is also important – along with critical policies that support child and youth well-being. Countries at the top of the Index have improved or sustained greater overall income equality and high-quality, universal early childhood programs including parental leave and integrated early health, development and learning. The values of a nation also matter. Countries that rank at the top tend to have a stronger collective commitment to child well-being and give greater priority to public investments in children from birth. Some, like the United Kingdom, that have adopted similar policies have climbed up the rankings. Lessons from these top performers must be considered in Canada if we are going to build the momentum we need and take the actions that are required as a nation to move out of the middle ranking and achieve great outcomes for our children and youth.

1 There are 17 SDGs with 169 targets. For Report Card 14, UNICEF focused on the Goals and targets with the greatest direct impact on children and youth in high-income country contexts.

2 Indicators for which Canada has no data are noted in the Appendix.

3 Countries of the European Union (EU) and the Organization for Economic Co-operation and Development (OECD).

4 See UNICEF Report Card 13 (2016).

5 Ibid.

GREAT CHILDHOODS

No generation should have to settle rather than dream.

The standards achieved by the highest-performing nations should contribute to debate in Canada about how to achieve them here. Data provided through reports such as UNICEF Report Cards are critical to understanding where we are successful as a nation and where we can make improvements, and help us set goals for where we need to go. But data for data's sake is not valuable – it must drive action. In the past, we have focused considerable debate on the data: What is the best way to measure child poverty? Are immunization rates in Canada really that low? Those are important questions, but they aren't the questions that will move us forward. What if we focused instead on how we might create better outcomes? The data are a starting point for debate: Why does Canada rank so low on the Index and why haven't we seen any momentum up these indices over the past decade? Are we content to be good, or do we want great outcomes for our children and youth? What will it take to move up the Index? The universal SDG Agenda is a window of opportunity to bring about a dramatic change in the well-being of children across Canada, including Indigenous children and youth. As a baseline year, the 150th birthday of Canada's Confederation could be the point of departure to accelerate and push past mediocrity.⁶

Clearly, better is possible. It is also measurable within a short timeframe when a society has clear targets and smart policies. The well-being of children is a shared responsibility among families, communities, the private sector and public institutions, but all of the well-being indicators in the Report Card are influenced by social values and by policy choices at all levels of government. The Canadian Companion to

UNICEF Report Card 14 highlights the actions that could have the greatest impact across a range of indicators. Canada's recent advances in public policy and investment for children, including child-focused income benefits, may create measurable progress in the coming years. There remains considerable distance to cover to achieve the quality, universal policies that are clearly working in the top-performing nations, including parent/child leave benefits, early child development programs and measures to further reduce child poverty and broader income inequality. Will Canadians call on our political leaders to act quickly and with determination to improve the well-being of children and young people? And will we all do our part as individuals and communities? There is an untapped wealth in social innovation for and with children and youth. Where indicator rankings are lowest and the "Possibility Gaps" are widest, we can invest, direct policies and services, and innovate other actions to close them. We also need to ask if our investments, policies, programs and actions need retooling to address the aspects of children's lives where indicators are eroding: the "Progress Gaps."

These are disruptive, uncertain times, but one thing has become crystal clear. To "build a strong, fair Canada built for change," the national agenda ushered in with the federal budget this year, we need to build strong, fair childhoods. We need better outcomes to enable our children and young people to thrive in a rapidly changing society in a rapidly changing world.

Are we ready?

6 See UNICEF Report Card 7 (2007), UNICEF Report Card 9 (2010), UNICEF Report Card 11 (2013) and UNICEF Report Card 13 (2016).

Measuring and monitoring the state of children and youth in the Sustainable Development Goals

For the past 70 years, UNICEF has played a leading role in advocating for and developing better data on the situation of children and youth worldwide. We've created regular progress reports on the state of children, innovations like our indices and new approaches to measuring child poverty and inequality. We have built the capacity in more than 100 countries for data relating to the well-being of children including the Multiple Indicator Cluster Survey (MICS) – the world's largest children's census. We work with governments and agencies in data collaboratives to create and standardize approaches to indicators and surveys. We are developing innovative ways with and for children and youth to create their own data, like U-Report and Wellbot.

The Sustainable Development Goals and targets expand the typical frameworks of child and youth well-being, but they also exclude some important indicators. Of the SDG indicators directly focused on children, some are more relevant than others to children in high-income countries. Some of the indicators recognize and have direct relevance to Indigenous children, who are deprived of some of the basic living conditions enjoyed by non-Indigenous children. SDG indicators range across the "ecology" of childhood, from outcomes in children and youth to indicators related to family, social and institutional conditions around them and across their lifecourse. Different social and institutional conditions explain most of the differences in child well-being across affluent nations.

The primary lens for the SDG targets is their contribution to broad social well-being and prosperity within a sustainable environment. They are seen by the world leaders and partners who shaped them as the necessary prerequisites for sustainable development. A focus on comprehensive child and youth well-being would include more indicators and typically would exclude some of the SDG indicators. So, the child-focused SDG indicators can be integrated with comprehensive child well-being monitoring, and play their part in national sustainable development monitoring.

A considerable challenge is the lack of data – particularly internationally comparable data – to measure many of the SDG targets. The indicators in UNICEF Report Card 14 adhere as closely as possible to a range of relevant SDG targets for which there is internationally comparable data, as a starting point. They are not an exhaustive set of child-focused SDG indicators, nor of child and youth well-being, but are curated to cover a wide set of SDG goals. As a custodian for ten of the global SDG indicators and co-custodian for the remaining seven, UNICEF supports national and international partners in meeting the data demands of the SDGs, including the development of child-related indicators, global data standards and national statistical capacity building. Measuring progress – or the lack of it – in the well-being of children and youth is essential to policy-making, to the cost-effective allocation of limited resources and to transparency and accountability. Like all countries, Canada has data gaps to fill to measure the SDGs, which will contribute to better monitoring of the state of Canada's children.

UNICEF league table of child and youth well-being across Sustainable Development Goals (SDGs)

Country	No poverty	Zero hunger	Good health and well-being	Quality education	Decent work and economic growth
Norway	1	4	5	9	5
Germany	8	8	4	7	6
Denmark	4	2	21	5	10
Sweden	6	9	13	16	7
Finland	2	15	16	1	15
Iceland	3	17	2	27	18
Switzerland	5	3	12	11	2
Republic of Korea		5	10	3	12
Slovenia	11	27	11	23	9
Netherlands	7	6	6	17	8
Ireland	9	31	22	13	37
Japan	23	1	8	10	1
United Kingdom	16	34	15	20	31
Luxembourg	19	12	14	25	3
Austria	10	10	9	26	24
Spain	28	26	3	12	36
Estonia	18	20	26	21	14
Portugal	30	32	1	24	26
France	15	7	17	14	20
Czech Republic	17	16	25	22	13
Australia	12	28	23	39	23
Croatia	20	14	24	36	35
Poland	22	24	32	31	4
Italy	31	23	18	19	30
Canada	32	37	29	8	11
Belgium	14	11	19	6	28
Cyprus	13	30		34	21
Latvia	27	21	27	18	16
Malta	24	39	28	2	29
Slovakia	21	19	34	35	19
Greece	29	35	20	33	32
Hungary	26	22	31	30	33
Lithuania	25	25	33	29	27
New Zealand		18	38	15	34
Israel	36	13	7	28	22
Turkey		40	37	41	
United States	33	36	36	32	17
Mexico	34	41	30	4	40
Romania	37	33	35	40	25
Bulgaria	35	38	39	38	39
Chile		29	40	37	38

Higher Average Lower insufficient data

	Reduced inequalities	Sustainable cities and communities	Responsible consumption and production	Peace, justice and strong institutions
	2	2	13	30
	9	24		15
	3	20	19	10
	11	6	21	5
	4	5	11	29
	1	8	27	1
	7	27	31	7
	16		22	23
	10		2	13
	12	34	33	14
	8	1	8	9
	32	33	36	8
	6	14	9	16
	15	31	28	19
	13	18	30	28
	28	16	16	4
	29	4	4	35
	27	7	1	27
	34	23	25	21
	31	26	24	6
	17	3	18	18
	18	11	14	11
	23	17	10	20
	20	30	15	2
	14	19	6	37
	19	36	32	32
	5	22		36
	25		12	38
	21	32		12
	24	10	29	26
	36	28	17	3
	30	21	23	17
	33		5	31
	26	9	35	33
	39	37	34	25
	22	29	3	22
	35	13	20	40
	41	15		
	38	12	37	24
	40	25	7	34
	37	35	26	39

The league table summarizes the overall findings of this Report Card. Countries are listed in order of their average performance across nine Sustainable Development Goals. Goal 5 (Gender) is also included in the Report Card, but there were too many gaps in the available data for the results to be incorporated into this composite table. Before goals with multiple indicators are ranked, each indicator has been normalized using a z-scores method and averaged using equal weights. Each country's rank within a particular goal is shown, ranging from 1 for the highest performer to 41 for the lowest.

Figure 1: How Canada ranks by Sustainable Development Goal (SDG)

Position	Sustainable Development Goal (SDG)	Rank	Distance from Mean Ranking
Top	Responsible Consumption and Production	6	13
	Quality Education	8	13
	Decent Work and Economic Growth	11	10
	Reduced Inequalities	14	7
Middle	Sustainable Cities and Communities	19	0
Bottom	Good Health	29	-9
	No Poverty	32	-13
	Zero Hunger	37	-16
	Peace, Justice and Strong Institutions	37	-17

Figure 2: How Canada ranks by indicator

Indicator	Rank	Value	Best Performing Country
Basic Learning Proficiency	4	80.8%	83.1%
Children in Jobless Households	4	4.2%	2.1%
Awareness of Environmental Problems	6	71.0%	82.0%
Income Advantage Gap	11	32.9%	20.6%
Teen Mental Health	14	22.0%	14.2%
Teen Drunkenness	17	7.2%	1.7%
Breastfeeding	18	30%	71%
Preschool Participation	19	96.5%	99.9%
Air Pollution in Cities	19	9.7 PM2.5µ	4.8 PM2.5µ
Excluded Youth (NEET)	20	7.1%	2.0%
Bottom-end Income Inequality	23	51.6%	34.2%
Teen Births	23	9.5/1,000	1.6/1,000
Child Income Poverty	24	22.2%	9.2%
Overall Income Inequality	24	1.12	0.70
Children's Food Security	24	11.9%	1.4%
Bullying	27	15.0%	4.5%
Social Transfers	29	21%	66%
Unhealthy Weight	29	25.0%	8.3%
Neonatal Mortality	31	3.6/1,000	0.9/1,000
Teen Suicide	31	8.5/100,000	1.7/100,000
Child Homicide	33	0.90/100,000	0.00/100,000

Figure 3: Index of Child and Youth Well-being and Sustainability (2017)

Rank	Country
1	Norway
2	Germany
3	Denmark
4	Sweden
5	Finland
6	Iceland
7	Switzerland
8	Korea
9	Slovenia
10	Netherlands
11	Ireland
12	Japan
13	United Kingdom
14	Luxembourg
15	Austria
16	Spain
17	Estonia
18	Portugal
19	France
20	Czech Republic
21	Australia
22	Croatia
23	Poland
24	Italy
25	Canada
26	Belgium
27	Cyprus
28	Latvia
29	Malta
30	Slovakia
31	Greece
32	Hungary
33	Lithuania
34	New Zealand
35	Israel
36	Turkey
37	United States
38	Mexico
39	Romania
40	Bulgaria
41	Chile

Figure 4: Canada's progress in 21 indicators of child and youth well-being**Indicators that have improved over time**

+ Overall Income Inequality
+ Child Income Poverty
+ Neonatal Mortality
+ Teen Drunkenness
+ Teen Births
+ Teen Suicide
+ Child Homicide

Indicators that have worsened over time

- Income Advantage Gap
- Basic Learning Proficiency
- Excluded Youth (NEET)
- Bottom-end Income Inequality
- Air Pollution in Cities
- Unhealthy Weight
- Teen Mental Health
- Bullying

NOTE: The changes over time may not in all cases be statistically significant; any direction of improvement or decline is included.

Figure 5: Indicators by size of the Canadian "Possibility Gaps" (largest to smallest)

Rank	Possibility Gaps	
1	Child Homicide	NOTE: The "Possibility Gap" is a theoretical measure of the difference between Canada and the best performing country in each indicator (calculated as the difference between the values as a percentage of the best performing country value). The larger the gap, the more room for improvement.
2	Children's Food Security	
3	Teen Births	
4	Teen Suicide	
5	Teen Drunkenness	
6	Neonatal Mortality	
7	Excluded Youth (NEET)	
8	Bullying	
9	Unhealthy Weight	
10	Child Income Poverty	
11	Air Pollution in Cities	
12	Children in Jobless Households	
13	Social Transfers for Children	
14	Overall Income Inequality	
15	Income Advantage Gap	
16	Breastfeeding	
17	Teen Mental Health	
18	Bottom-end Income Inequality	
19	Awareness of Environmental Problems	
20	Preschool Participation	
21	Basic Learning Proficiency	

Figure 6: Comparison of UNICEF Index rankings over time

Country	UNICEF Index of Child Well-being (Report Card 7) 2007	UNICEF Index of Child Inequality (Report Card 9) 2010	UNICEF Index of Child Well-being (Report Card 11) 2013	UNICEF Index of Child Inequality (Report Card 13) 2016	UNICEF Index of Child and Youth Well-being and Sustainability (Report Card 14) 2017
Norway	7	7	2	2	1
Germany	11	12	6	14	2
Denmark	3	1	11	1	3
Sweden	2	8	5	23	4
Finland	4	2	4	2	5
Iceland		5	3	20	6
Switzerland	6	4	8	2	7
Korea					8
Slovenia			12	9	9
Netherlands	1	3	1	6	10
Ireland	9	6	10	7	11
Japan					12
United Kingdom	21	21	16	14	13
Luxembourg		18	7	29	14
Austria	18	9	18	5	15
Spain	5	20	19	22	16
Estonia			23	8	17
Portugal	17	14	15	19	18
France	16	11	13	28	19
Czech Republic	15	16	14	11	20
Australia				13	21
Croatia				12	22
Poland	14	13	21	27	23
Italy	8	23	22	32	24
Canada	12	10	17	26	25
Belgium	10	15	9	29	26
Cyprus					27
Latvia			28	10	28
Malta				24	29
Slovakia		19	23	31	30
Greece	13	22	25	14	31
Hungary	19	17	20	14	32
Lithuania			27	25	33
New Zealand					34
Israel				35	35
Turkey				34	36
United States	20	24	26	18	37
Mexico					38
Romania			29	21	39
Bulgaria				33	40
Chile					41

Canada's rank on the Index of Child and Youth Well-being and Sustainability

25TH | **OUT OF 41 COUNTRIES**



Global Goal 12: Ensure sustainable production and consumption

Canada ranks 6



Global Goal 4: Ensure inclusive and equitable quality education for all

Canada ranks 8



Global Goal 8: Promote full and productive employment and decent work for all

Canada ranks 11



Global Goal 10: Reduce inequality within and among countries

Canada ranks 14



Global Goal 11: Make cities inclusive, safe, resilient and sustainable

Canada ranks 19



Global Goal 3: Ensure healthy lives and promote well-being

Canada ranks 29



Global Goal 1: End poverty in all its forms everywhere

Canada ranks 32



Global Goal 2: End hunger, achieve food security and improved nutrition

Canada ranks 37



Global Goal 16: Promote peaceful and inclusive societies

Canada ranks 37

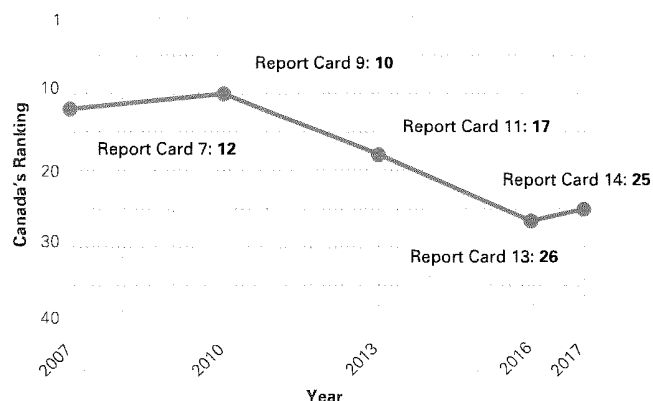
Norway
RANKED 1ST



Canada
RANKED 25TH



Chile
RANKED 41ST



NOTE: These Indices and rankings are not directly comparable as different indicators and measurement approaches are used, but a number of indicators are consistent and the data reveal some consistent patterns. UNICEF Report Cards 7, 11 and 14 are based on national averages for each indicator of child and youth well-being; Report Cards 9 and 13 measure equality gaps within indicators.

CANADA AT THE TOP

Canada performs well in indicators related to our strong, universal public education system – as it does consistently – particularly now that public policy is starting to catch up to peer nations in the provision of preschool child development and learning opportunities.

As many wealthy countries suffered considerable job and income losses during the Great Recession in contrast to Canada, our performance in related indicators of children's material well-being and social inclusion is also comparably better. Our moderate level of income inequality looks fairly benign in contrast to some other high-income countries, but UNICEF research suggests that moderate income inequality may be associated with mediocre child well-being outcomes on average, and persistent inequality gaps among Canada's children.⁷ There are encouraging signals that Canada may be starting to turn the tide against child poverty and income inequality, but the poorest group (the bottom 10% by family income) has made fewer gains than everyone else. Erosion in the income advantage gap, the NEET rate, and mental and physical health may be signs of the continuing impacts of inequality.

RESPONSIBLE CONSUMPTION AND PRODUCTION (GOAL 12)

— Canada ranks 6



Awareness of Environmental Problems

Top performer:

PORTUGAL — 82.0%

Possibility Gap:⁸

11

PERCENTAGE POINTS

Average:

62.1%

Canada:

71.0%

(RANKS 6)

Direction of change:⁹

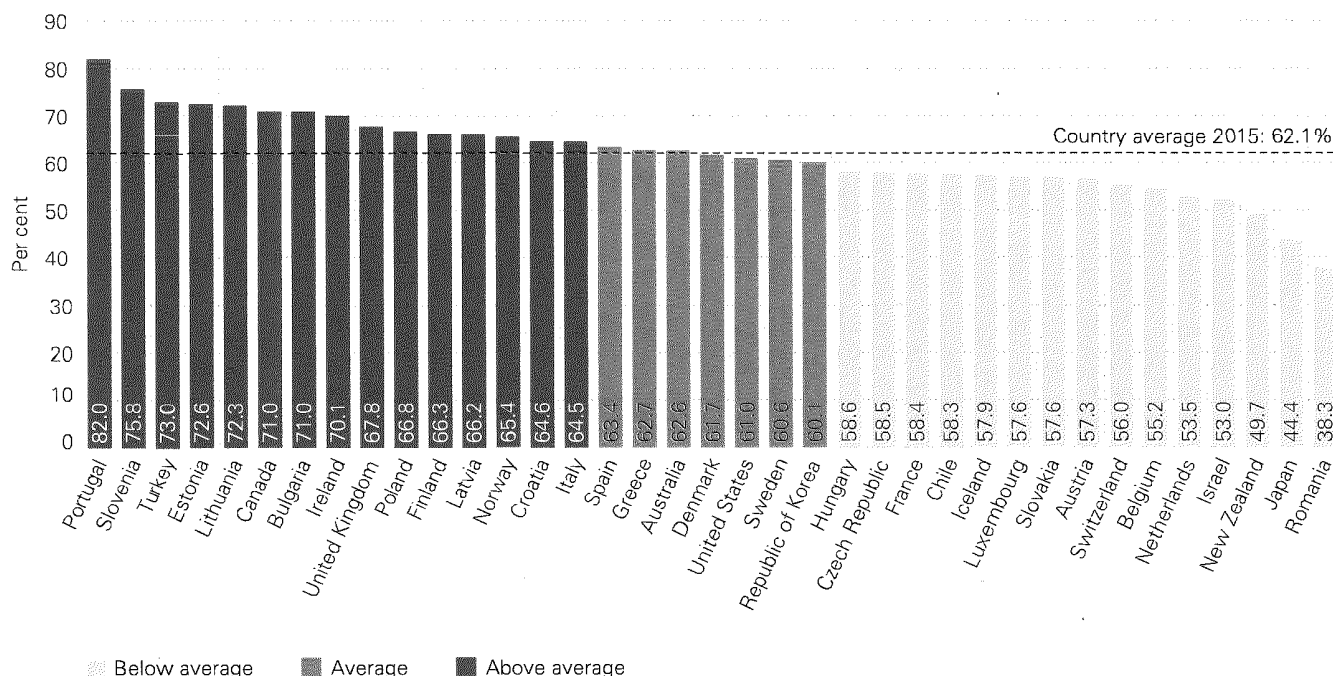
N/A

SDG 12 to achieve sustainable consumption and production includes few child-focused targets and indicators. Indicator 12.8.8 is the most directly relevant target involving children and youth in high-income countries, with available data to measure the level of environmental

awareness among students. Canada is not known as a world leader in sustainable consumption and production according to indicators such as waste production, material consumption or carbon emissions per capita. However, the greater young people's understanding of the impact

of human activity on their environment, the more they will be able to contribute to progress towards sustainability.

Figure 7 shows that most young people in high-income countries are aware of current environmental challenges: an average of 62 per cent

Figure 7: Percentage of 15-year-old students familiar with five or more environmental issues

of 15-year-olds are familiar with at least five of seven key issues at age 15:

- greenhouse gases in the atmosphere
- use of genetically modified organisms (GMOs)
- nuclear waste
- the consequences of clearing forests for other land use
- air pollution
- extinction of plants and animals
- water shortage

Canada is a strong performer, with 71 per cent of youth aware of these issues. In general, air pollution had the highest level of recognition, with around 83 per cent of students having some knowledge of this. Given its prevalence and direct impacts on children and youth, this awareness is not surprising. Many youth are also aware of the extinction of plants and animals (79 per cent). Awareness of the effects of greenhouse gases fell in the middle, with 65 per cent of students

able to explain the problem. More than aware, many young people are deeply concerned about their environment and in our workshops with young people it was clear that Indigenous youth are particularly aware of and affected by interconnected environmental concerns (UNICEF Canada, 2017). Their awareness is a promising sign for the sustainability of the planet.

7 See UNICEF Report Card 13 (2016).

8 The "Possibility Gap" is the distance, or difference in values, between Canada and the top-performing country. The value may not be statistically significant in all cases.

9 The value may not be statistically significant in all cases.

QUALITY EDUCATION (GOAL 4)

— Canada ranks 8



Basic Learning Proficiency

Top performer:

ESTONIA — 83.1%

Possibility Gap:

2.3

PERCENTAGE POINTS

Average:

68.6%

Canada:

80.8%

(RANKS 4)

Direction of change:

NEGATIVE

(2.2 PERCENTAGE POINTS)

Providing inclusive, quality education is key to the SDGs. Failure to achieve basic skills and a minimum level of educational achievement imposes a high cost on individual children and on society through school dropout, lower productivity and wages, and higher unemployment. Achieving universal proficiency in fundamental skills ensures a fairer chance in life for all children and young people. At the same time, getting a balance right so that young people are self-directed learners valued for their unique capacities and dreams, with adaptable skills for a rapidly changing world of work, is a challenge in

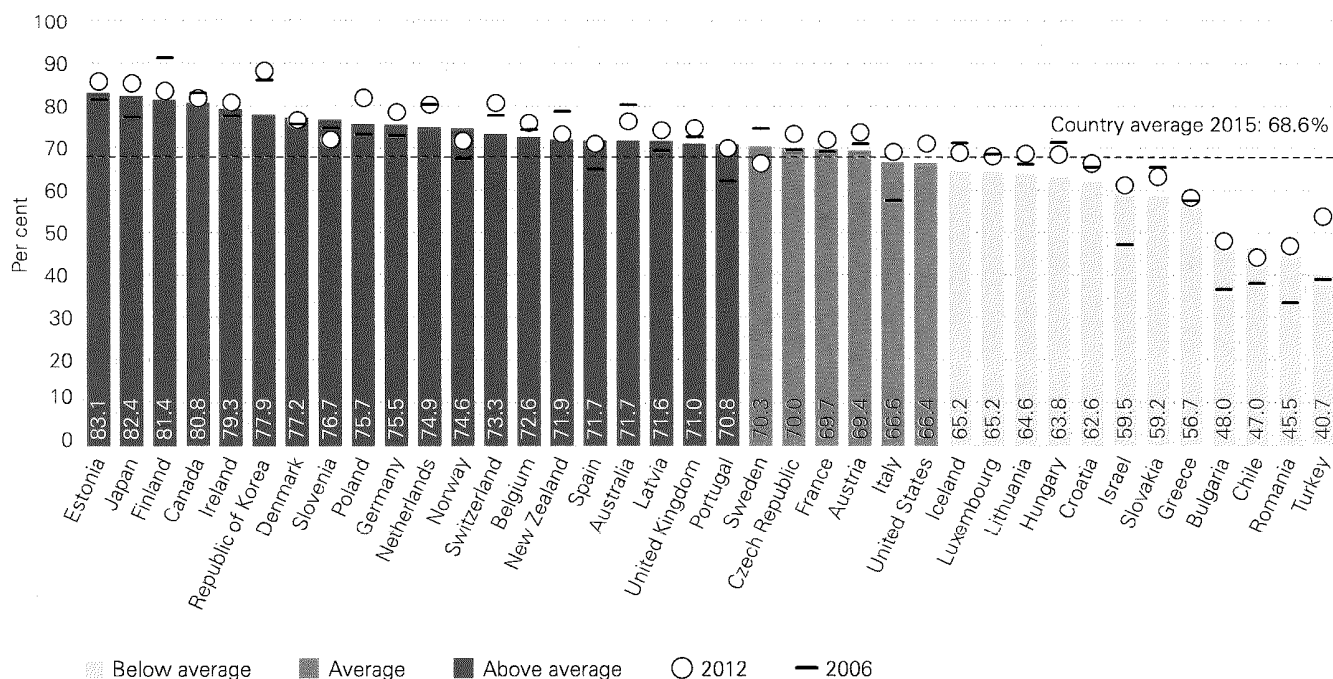
advanced education systems. Canada is developing new approaches to measure how well education systems support children's holistic learning and well-being while preparing them for futures not yet imagined.¹⁰

For now, measures of basic competency in reading, mathematics and science literacy show that even in the best-performing countries, 1 in 5 15-year-olds does not reach a level of basic competency (see figure 8). No country, no matter how wealthy or how long established its education system, approaches universal competency in reading, mathematics and science

among its 15-year-olds. Countries with broader inclusion, of over 80 per cent, are Canada, Estonia, Finland and Japan (above the average of 69 per cent). Their national educational approaches – although diverse – are evidently more successful than others in ensuring baseline competency. However, some countries make much more effective use than others of the resources they have available: the highest-performing nation of all on this measure, Estonia, has a per-capita national income that is less than half that of the other countries in the top five. Canada's performance has remained stable for many years.

¹⁰ See People for Education, *Measuring What Matters* initiative.

Figure 8: Achievement of baseline educational standards (proportion of 15-year-olds achieving baseline competency in reading, mathematics and science)



"In Toronto we might get lots of programs, maybe the rest of Canada is lacking them."

– Workshop Participant, 15

Preschool Participation (ages 3 to 6)**Top performer:****MALTA — 99.9%****Average:****95.3%****Canada:****96.5%**

(RANKS 19)

Possibility Gap:**3.4**

PERCENTAGE POINTS

Direction of change:**N/A**

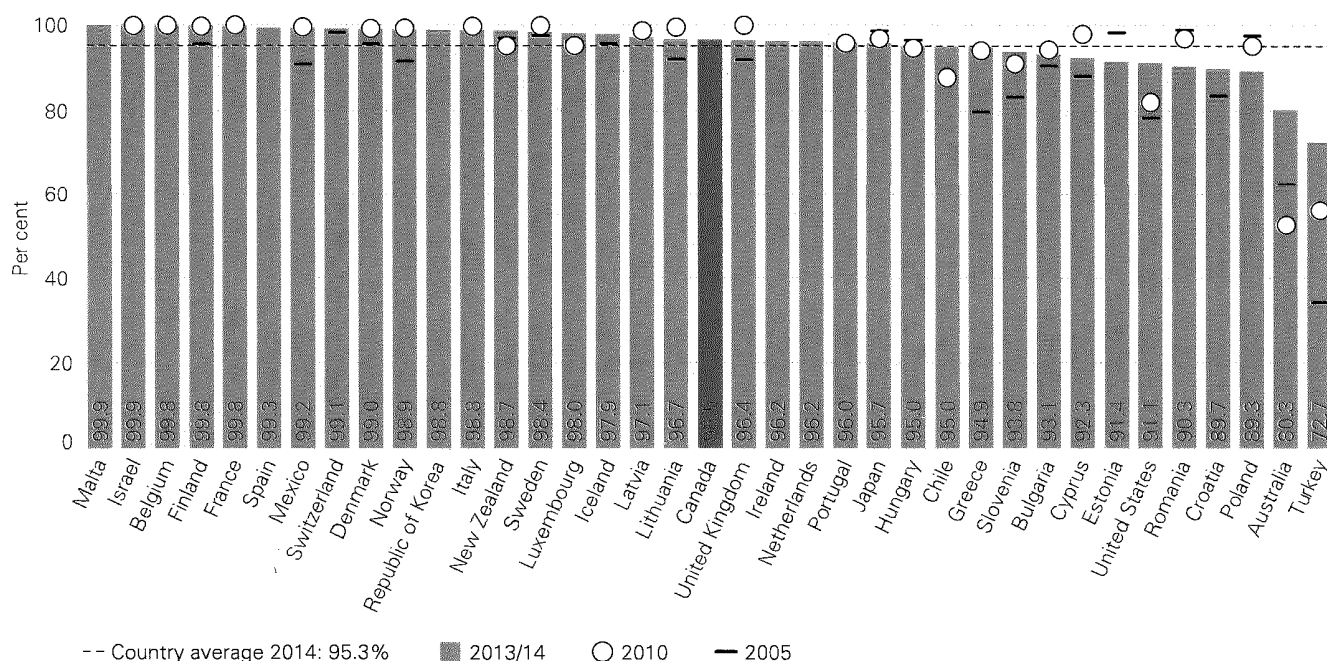
Target 4.2 of the SDGs aims to “ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education.” Early childhood development is a driving force for sustainable development in all societies (Britto, Yoshikawa, & Boller, 2011). Through public investment in quality, universal early care and education, a good start in life can not only benefit children today, but also their communities and societies into the future. A growing body of evidence attests to the long-term benefits of high-quality preschool education and care for children aged between three and

five, highlighting positive outcomes in their development, education, health, jobs, reduced criminal behaviour and poverty reduction. These effects seem to be particularly positive for children from disadvantaged backgrounds.

Figure 9 shows that almost all children in high-income countries are benefiting from some level of organized learning one year before starting school, which begins much later in some countries than in others. On average and in Canada, over 95 per cent of children participate in formal preschool provision. Canada’s provinces and territories have made substantial progress in recent years to

provide universal preschool learning in the year before formal education starts. But it remains an outlier in the provision of universal, quality early child development opportunities for younger children. Expanding coverage is a key opportunity for Canada to put children on a track toward great, equitable outcomes. The inclusion of the federal government as a partner in a new National Framework on Early Learning and Child Care with provincial, territorial and Indigenous governments is a key step, though the initial investment and coverage are substantially less than in top-performing countries. Canada has a lot of ground to cover.

Figure 9: Children's participation in organized preschool learning (participation rate one year before official age for entering primary school)



NOTE: Data for Canada refer to adjusted net enrolment rate, one year before the official primary entry age, both sexes (%). Data provided by Martha Friendly, Childcare Resource and Resource Unit, Canada.

Making early learning and care programs good for kids

SDG target 4.2 emphasizes the importance of access to high-quality early childhood education and care (ECEC) as a means to achieving equity and transforming lives through good early cognitive, physical and social development. Access alone is insufficient for achieving positive child outcomes; services must also be of high quality. As a result, meeting target 4.2 means developing methods to accurately measure and monitor quality standards in ECEC (Braukauf & Hayes, 2017). At a minimum, measures of quality should capture: (a) the system design and organization (structure) of services, including qualifications, staff-child ratios and health and safety regulations; (b) practice within ECEC settings (process), including relationships, the role of play and the integration of care and education; and (c) child outcomes, including the child's social, emotional, mental and physical well-being and equality of opportunity, as well as secondary benefits to family and community.

For national monitoring efforts key considerations include:

- Monitoring ECEC quality in different contexts. ECEC services in high-income countries vary widely in terms of decentralization, curriculum and funding structure, but the indicators of quality service provision and child outcomes are fairly universal.

- The interplay between home environment and formal care. The child's home environment and its interaction with formal settings influences child outcomes, and measures should be sensitive to this. ECEC services are most effective when there are sufficient family support policies and services such as income benefits.
- What it means to be 'ready for primary education' or 'developmentally on track'. Quality ECEC settings foster child development, and recognize children as unique, active learners and capable explorers of their environment. The concept of 'school readiness' can be problematic if it shifts the focus too far from how children learn through play – vital in developing skills such as self-regulation and attentiveness – towards a more school-like pedagogy emphasizing the development of 'basic skills' such as literacy. It can also be problematic if it fails to support children's unique developmental trajectories.

As Canada's federal, provincial, territorial and Indigenous governments develop frameworks for ECEC, they can ensure quality is high on the policy agenda by collecting data for both service provision and child-focused outcomes. This will link improvements in the quality of ECEC to other policy measures and enhance equity in access and in outcomes.

Data Pothole

Indicator 4.2.1 measures the percentage of children under 5 years of age who are developmentally on track in health, learning and psychological well-being. Basically, the made-in-Canada Early Development Instrument provides this data (now used by many provinces), but it is not used in enough peer nations to include in the UNICEF Index. The EDI results underscore the importance of providing more early child development programs in Canada. Developmental challenges show up before children start school. EDI results also reveal the importance of a universal approach: while the income-deprived children have disproportionately more developmental challenges by age 5, the majority of children are in higher-income families.

Data Pothole

Indicator 4.5.1 calls for parity indices for education-related SDGs. In high-income countries, children in lower-income families, Indigenous children and boys fall farther behind. Indicator 4.a.1 calls for a measure of the equitable distribution of educational resources, including computers and infrastructure for students with disabilities.

DECENT WORK AND ECONOMIC GROWTH (GOAL 8)

— Canada ranks 11



Excluded Youth (NEET)

Top performer:

JAPAN 2.0%

Average:

7.1%

Canada:

7.1%

(RANKS 20)

Possibility Gap:

5.1

PERCENTAGE POINTS

Direction of change:

NEGATIVE

(0.2 PERCENTAGE POINTS)

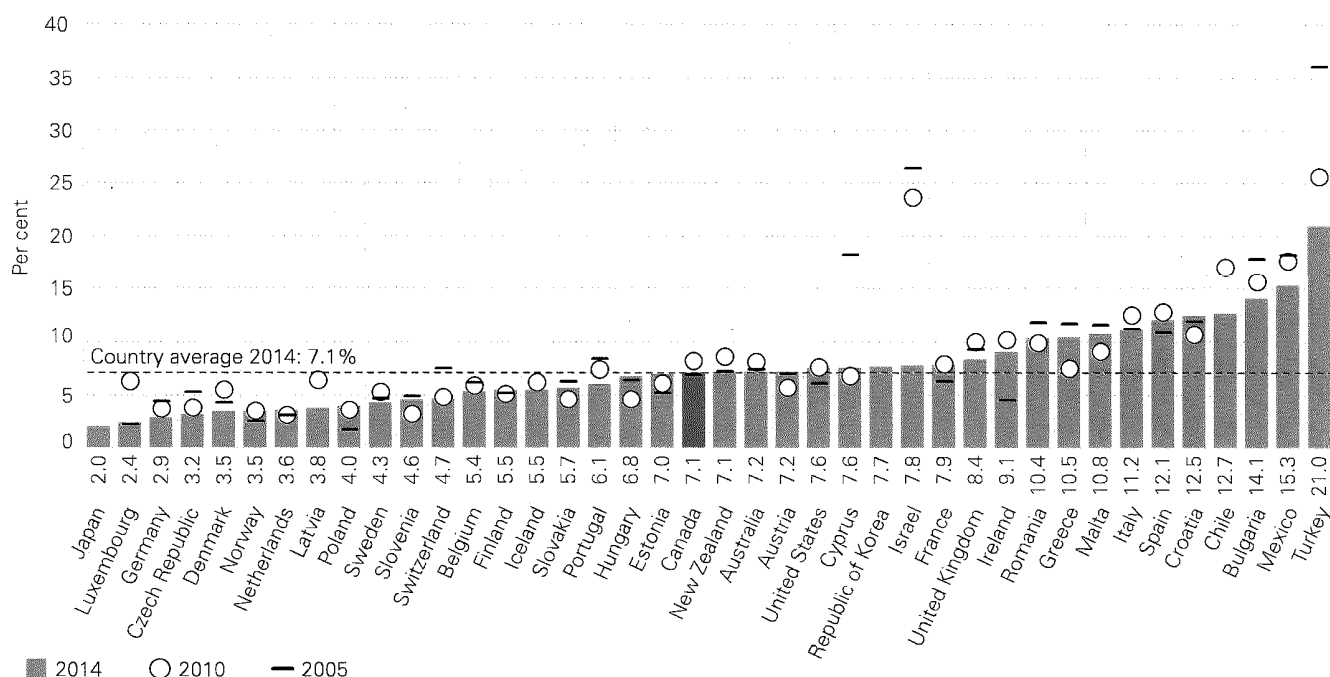
Any strategy for achieving sustainable economic development has to include opportunities for young people transitioning to adulthood to engage in full, productive employment. A key measurement of countries' success in delivering opportunities for young people and an official SDG indicator (8.6.1) is the share of youth aged 15-24 not in education, employment or training (NEET). Given the focus on children in this report, in figure 10 we measure NEET for ages 15-19. In Canada and on average across wealthy countries, 7 per cent or 1 in 13 young people is not in employment, education or training. NEET rates have fluctuated in Canada and in most countries over the past decade, particularly since the Great Recession ended, as more young people graduate high school and continue post-secondary education. But for some, constrained education and employment opportunities discourage high school engagement

and achievement, and contribute to poor mental and physical well-being. Many young people not in education or at work are not developing their skills or their confidence and may be at higher risk of social isolation, involvement in risky behaviour, and poor mental and physical health (Bell & Blanchflower, 2011; Eurofound, 2012). NEET status is affected not only by opportunity at the stage when young people are transitioning to adulthood, but also by opportunity in the early years, since those starting life with fewer advantages tend to accumulate disadvantage. Young people who don't complete high school and who become homeless are typically part of the NEET population.

The solutions include a focus on creating affordable and diverse education opportunities for young people from the early years through high school and post-secondary years,

and creating decent employment. Canada's governments at all levels, private-sector employers like RBC, and programs such as Pathways to Education have been adjusting to make education and employment more inclusive through a range of programs. Support for "green" jobs and apprenticeships could also help power the sustainability agenda. Opportunities within these measures need to include the most vulnerable, including Indigenous children and children in care. Making the Shift is a new social innovation approach that aims to help ensure that homeless young people achieve housing stability and family supports that are essential to stay in school or access training and employment.¹² Given Canada's average performance in NEET, we have a lot of work ahead to close the gap with the best-performing countries, which achieve NEET rates that are half of Canada's.

11 See *Making the Shift*, The Homeless Hub: <http://homelesshub.ca/blogs/making-shift>.

Figure 10: Proportion of youth (aged 15-19) not in education, employment or training (NEET rate)

Children in Jobless Households

Top performer:

JAPAN — 2.1%

Average:

9.0%

Canada:

4.2%
(RANKS 4)

Possibility Gap:

2.1
PERCENTAGE POINTS

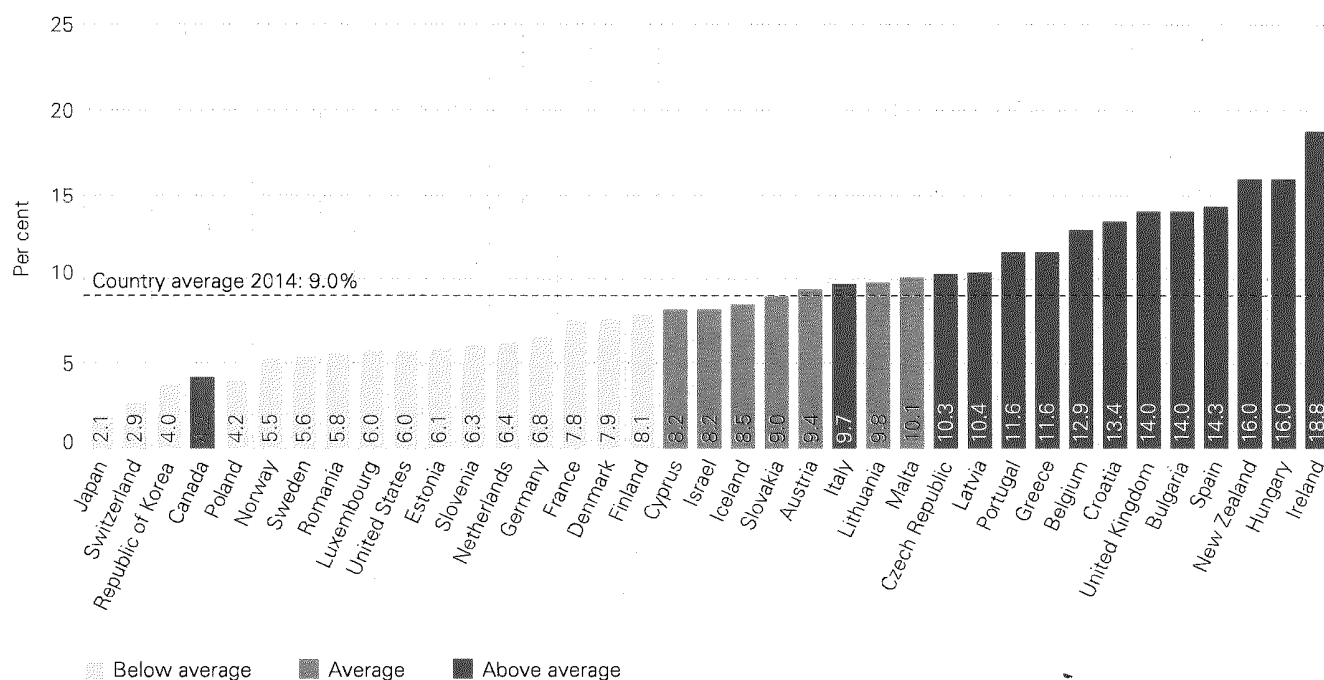
Direction of change:

NO CHANGE

Another key indicator related to Goal 8 is adult unemployment. Growing up in a household where no adult works has been linked to a greater risk of income poverty (OECD, 2011), poorer education achievement, bullying and being NEET (Schoon et al., 2012). Figure 11 shows the proportion of children living in households where nobody has a paid job. About one in ten children in the countries surveyed lives in a household where

no one works for pay, and the rate has worsened in many rich countries since the Great Recession. The results range from 2 per cent of children in Japan to 19 per cent in Ireland. In Canada, only 4 per cent of children live in jobless families – half the average across peer nations. This compares very favourably, though the rate has not improved in recent years. Instead, Canada has a substantial proportion of “working poor” families.

Most Canadian children in low-income families have at least one parent who works full-time. Our particular challenge is to create decent jobs that pay a living wage, and continue to improve child-focused income benefits and universal services to ensure children are not deprived at a vulnerable stage of life by employment conditions and children’s services that fail to include all Canadians.

Figure 11: Proportion of children under 18 in jobless households (based on self-defined economic status of adults)

Data Pothole

Goal 8 includes indicators of the percentage and number of children aged 5-17 engaged in child labour (8.7.1) and the frequency of fatal and non-fatal occupational injuries (8.8.1). Young people are particularly vulnerable to exploitative, dangerous working conditions, and there is considerable variability in these conditions across the country. As Canada works to comply with International Labour Organization treaties, data is a necessary tool to track their compliance.

REDUCED INEQUALITIES (GOAL 10)**— Canada ranks 14****Overall Income Inequality****Top performer:****ICELAND — 0.70****Average:****1.17****Canada:****1.12**

(RANKS 24)

Possibility Gap:**0.42****Direction of change:****POSITIVE**

(0.03 PERCENTAGE POINTS)

Much of the focus of efforts to improve child well-being is on the child poverty rate, given the negative impacts of low income on a range of child outcomes. Emerging research by UNICEF and others is bringing into sharper focus the dampening impacts of overall income inequality – the income gap between the richest and everybody else – on child well-being broadly (UNICEF, 2016). Children growing up in less equal countries tend to have worse average outcomes and more inequality among them, particularly in health, the quality of relationships children have with parents and peers, levels of violence and life satisfaction (UNICEF Office of Research, 2016). In more unequal countries, child poverty is more intractable, and children's family income plays a larger

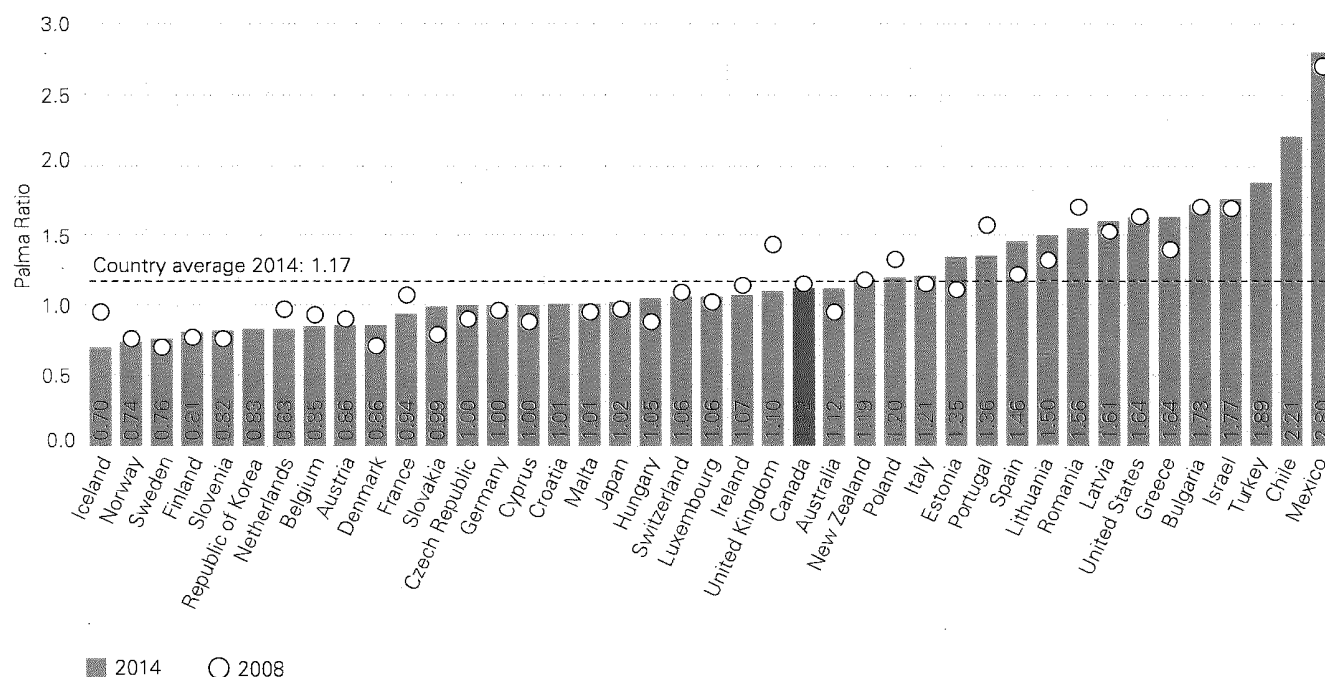
role in determining their access to opportunities and resources.

One of the key SDG indicators of inequality uses the Palma Ratio, which measures the income share of the bottom 40 per cent of the population relative to the top 10 per cent.¹² Figure 12 measures this inequality gap for households with children under age 18 (values below 1 indicate less inequality; values above 1 indicate more inequality).

Most high-income countries spread their wealth very unequally. In two-thirds of countries, the bottom 40 per cent of households with children have less income than the top 10 per cent. A third of these countries have Palma Ratios less than 1; they

share their wealth more equally, and it is no coincidence that they tend to have better overall child well-being outcomes. In Canada, the Palma Ratio is close to 1, a little better than the average but still more unequal than most countries. The share of total income going to the top 10 per cent of households with children is 12 per cent more than the share of the bottom 40 per cent. The persistent level of income inequality in Canada may help explain why we have been stuck in the middle of league tables of child well-being. Countries with more income equality tend to have better outcomes for children and youth. The private investment gap and the gap in public investment in children and youth also contribute to wider inequalities among children.

¹² This is a child-focused adaptation of the Palma Ratio, where a value of 1.0 indicates that the income share of the top 10 per cent of the population is the same as that of the bottom 40 per cent. A value less than 1 indicates that the bottom 40 per cent receives a higher share of income than the richest 10 per cent; conversely, a value greater than 1 indicates they are receiving a smaller share.

Figure 12: Palma Ratio of income inequality based on households with children, 2014 and 2008

Children growing up in less equal countries tend to have worse average outcomes and more inequality among them, particularly in health, the quality of relationships children have with parents and peers, levels of violence and life satisfaction.

Bottom-end Income Inequality

Top performer:

ICELAND — 34.2%

Average:

51.2%

Canada:

51.6%

(RANKS 23)

Possibility Gap:

17.4

PERCENTAGE POINTS

Direction of change:

NEGATIVE

(1 PERCENTAGE POINT)

In the spirit of the SDGs, which seek to leave no one behind, an indicator of bottom-end inequality focuses on the gap between the poorest children and children with “normal” family incomes. Figure 13 shows that in most countries, the poorest 10 per cent of households with children under age 18 have fallen farther behind the median income in their countries over the past decade. A wide gap between the poorest 10 per cent and the median in Canada shows the importance of tracking bottom-end inequality along with broader income inequality. In Canada, the income of households with children at the bottom 10th percentile of the income distribution is about half that of families

at the median.

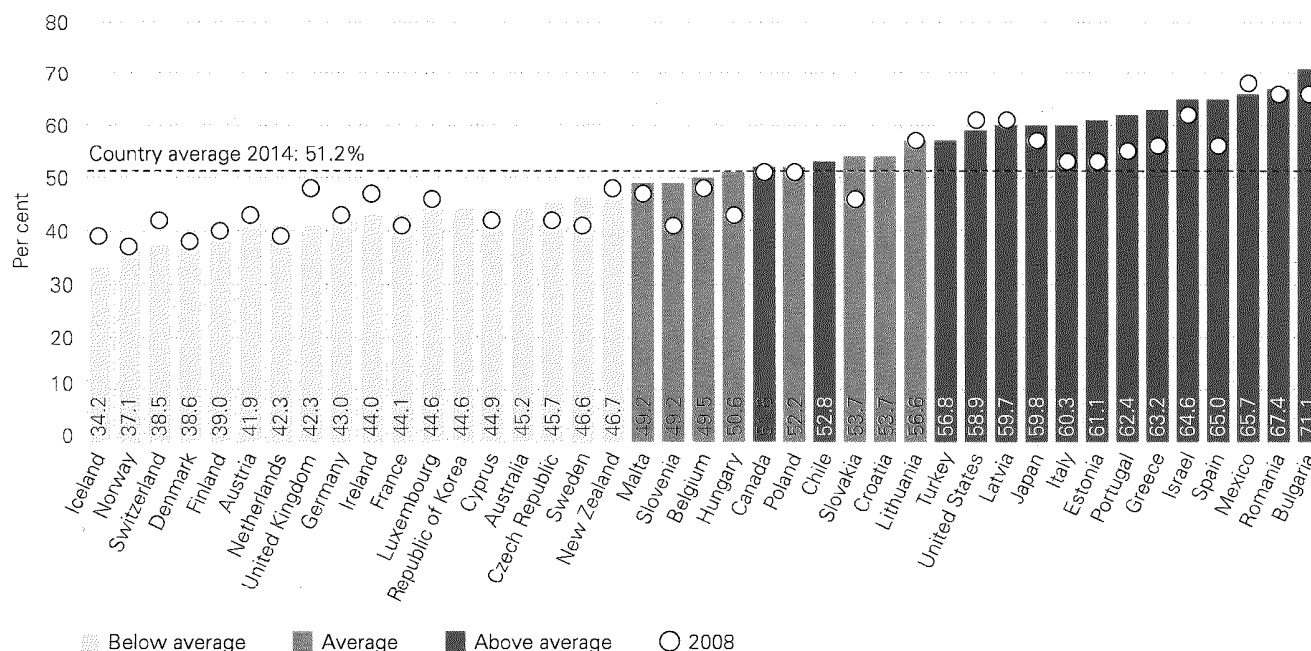
Canada is moderately unequal and close to the average values compared to peer nations measured by both the Palma Ratio and the UNICEF measure of bottom-end income inequality.¹³ In both measures, we have failed to make progress despite a consistent annual growth in GDP (national wealth), but over time bottom-end income inequality has widened more. Wealth accumulation in Canada is not helping to close the gaps in family income and well-being among children.

Measuring bottom-end inequality not only in income but in other indicators

of child well-being such as educational achievement and health is key to aligning efforts to reach and include the most excluded children, rather than relying on population averages to decide on investments, policies and services. The Canada Child Benefit is a progressive, universal program intended to benefit children broadly but particularly families with the lowest incomes. Canada needs to take a universal, progressive approach to more children’s services including parental leave benefits and ECEC. Countries that have the best child well-being outcomes generally take this approach to counter the impacts of income inequality on children and youth.

¹³ Relative income gap (“bottom-end inequality”) is measured as the gap between household income of the child at the 50th percentile (the median) and that of the child at the 10th percentile, reported as a percentage of the median.

Figure 13: Relative income gap between median income and that of the bottom 10 per cent of households with children, 2014 and 2008



The Canada Child Benefit is a progressive, universal program intended to benefit children broadly but particularly families with the lowest incomes. Canada needs to take a universal, progressive approach to more children's services including parental leave benefits and ECEC.

Income Advantage Gap

Top performer:

TURKEY — 20.6%

Average:

38.1%

Canada:

32.9%

(RANKS 11)

Possibility Gap:

12.3

PERCENTAGE POINTS

Direction of change:

NEGATIVE

(0.8 PERCENTAGE POINTS)

The adverse impacts of inequality can last a lifetime. One way in which this plays out is through the impact of socio-economic status on students' educational achievement. Children's family backgrounds cause their paths to diverge early in life, even before they start school, though early child development services can cut the gap.¹⁴ Some countries allow the gap to widen as children grow, affecting educational achievement by age 15, and their future opportunities.

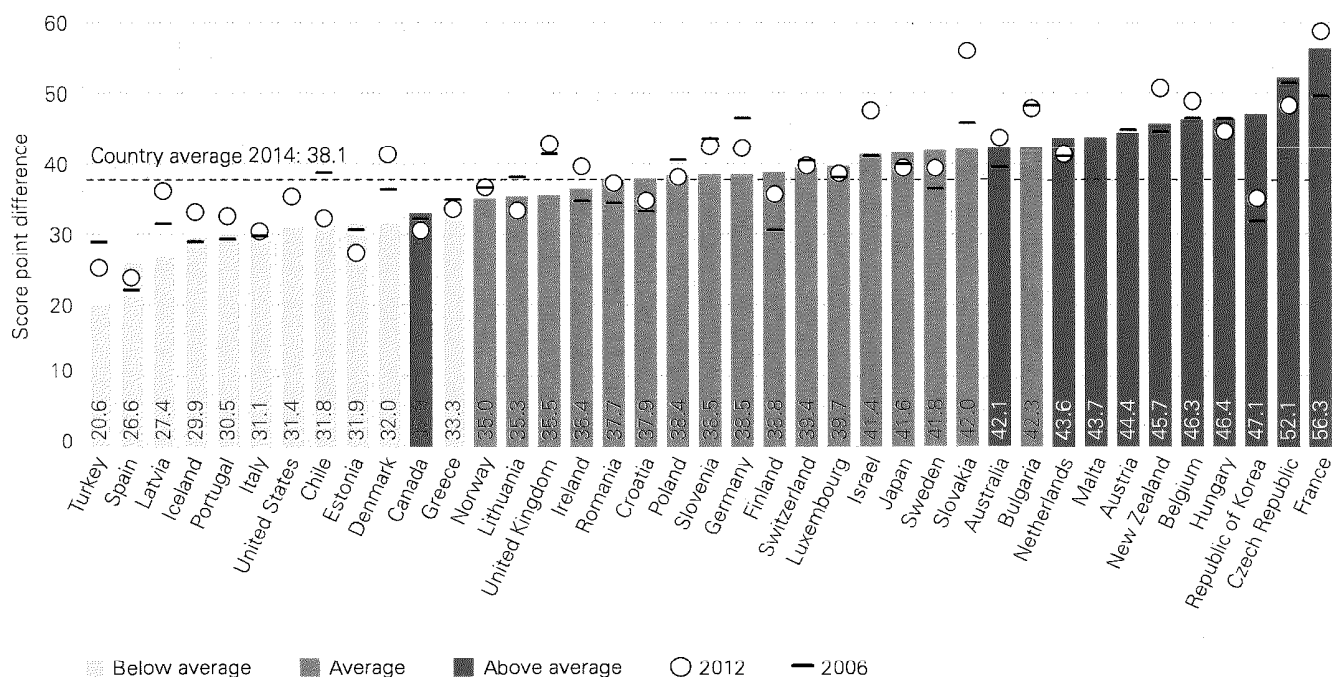
The Programme for International Student Assessment (PISA) has

developed a broad measure of socio-economic background: the ESCS index. Figure 14 shows the association between a one-unit increase in the ESCS index and students' results in reading, mathematics and science. A higher value indicates that socioeconomic background has a greater impact on students' achievement. Socio-economic advantage leads to better school results in every high-income country. Fifteen-year-olds from more affluent families achieve substantially better educational results than their less advantaged peers. On average, the

educational difference associated with a one-unit increase in the ESCS index is equivalent to more than one year of schooling.

Canada performs better than average. However, unlike many of the top-performing countries, we haven't managed to close the gap over the past decade. To do that, the solutions lie partly in the flexibility and inclusivity of school curriculum and engagement, but also in the reach of quality ECEC and in reducing levels of child poverty and income inequality.

14 See Bradbury, B., Corak, M., Waldfogel, J., & Washbrook, J. (2015). *Too many children left behind: The U.S. achievement gap in comparative perspective*. New York, NY: Russell Sage Foundation; Blanden, J., & Machin, S. (2010). Intergenerational inequality in early years assessments. In K. Hansen, H. Joshi, & S. Dex (Eds.), *Children of the 21st Century: The first five years* (Vol. 2, 153–168). Bristol: The Policy Press; Brooks-Gunn, J., & Duncan, G. J. (1997). The effects of poverty on children. *The Future of Children*, 7(2), 55–71. <https://doi.org/10.2307/1602387>; and Waldfogel, J. (2013). Socio-economic inequality in childhood and beyond: An overview of challenges and findings from comparative analyses of cohort studies. *Longitudinal and Life Course Studies*, 4, 268–275. <https://doi.org/10.14301/llcs.v4i3.263>.

Figure 14: Socio-economic advantage and school results

Data Pothole

Goal 10 includes an indicator of the percentage of the population reporting discrimination on a basis prohibited under international human rights law. In 2016, a Canadian Human Rights Tribunal found that the federal government discriminates in the provision of services to First Nations children. Services to which all Canada's children are entitled are funded and provided differently for First Nations communities, with many documented cases of First Nations children going without or provided with inferior services such as specialized wheelchairs (The Jordan's Principle Working Group, 2015). As the Government of Canada responds to better fulfil Jordan's Principle and provide equitable services, there is a need to collect and report data to measure the access and outcomes for Indigenous children.

CANADA IN THE MIDDLE

Goal 11 to achieve sustainable communities has few indicators directly related to children and youth for which there are internationally comparable data.

Air pollution is a universally relevant indicator of healthy environmental conditions in communities, particularly affecting growing children. But it is a limited vantage point on the Goal of “inclusive, safe, resilient and sustainable communities”. For instance, adequate housing would be another important indicator. Community safety indicators relevant to children and youth are well-developed in many parts of Canada and include a wide range reflected in the SDGs, from traffic safety and access to public transit to civic participation. All countries should have national strategies to track these indicators to fulfill their SDG obligations. In the general absence of comparable data across communities and countries, we rely on the official SDG indicator for monitoring air pollution according to annual mean levels of fine particulate matter in cities (11.6.2).

SUSTAINABLE COMMUNITIES (GOAL 11)

— Canada ranks 19



Air Pollution in Cities

Top performer:

IRELAND — 4.8 PM_{2.5}μ

Average:

10.7 PM_{2.5}μ

Canada:

9.7 PM_{2.5}μ
(RANKS 19)

Possibility Gap:

4.9 PM_{2.5}μ

Direction of change:

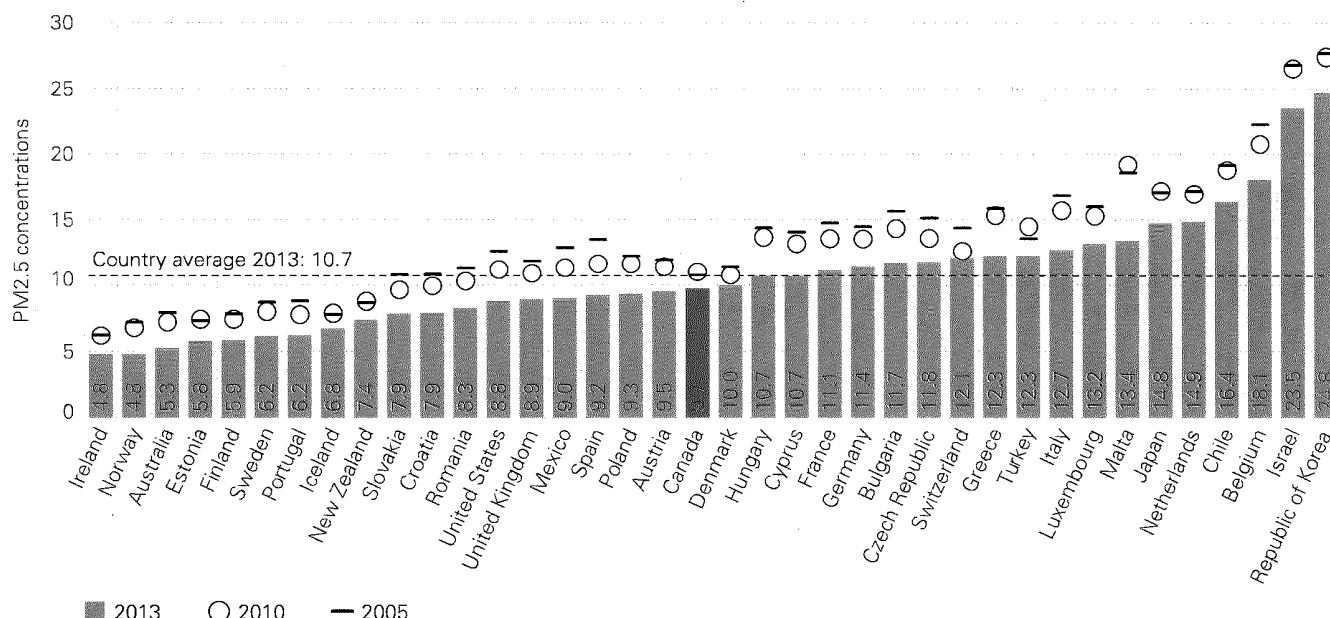
NEGATIVE
(0.5 PM_{2.5}μ)

Children are particularly susceptible to air pollution because they breathe in more air per unit of body weight than adults. Their lungs are especially vulnerable to damage from air pollution while developing in the womb and during the first years of life, and studies indicate that ultrafine particles can do permanent damage to children's brain tissue (UNICEF, 2016, p. 6). There is no question that making cities sustainable, safe and healthy for children requires reducing air pollution. The steady trend of urbanization makes the Goal more challenging to achieve. Outdoor play and exercise can be

harmful to health in heavily polluted environments. The decline in outdoor play is a growing concern in many high-income countries – itself a proxy indicator of child well-being because of its influence on physical and mental health, social development and many other dimensions of children's lives. Another indicator for Goal 11 directly relevant to children is the average share of the built-up area of cities that is open space for public use for all, including by age (11.7.1). This is also relevant to the aim of supporting free, outdoor play, but there is a lack of internationally comparable data at this time.

Figure 15 shows the annual average levels of air pollution in urban areas in rich countries, measured in concentrations of PM_{2.5}μ. This is particulate matter so fine that it is able to penetrate the lungs and enter the bloodstream, causing a variety of health problems (World Health Organization, 2016). The data have been weighted to take account of the proportion of children in each country living in urban areas. The World Health Organization has established a safe level of air quality to be below 10 micrograms of PM_{2.5}μ per cubic metre. Nearly half of high-income

Figure 15: Air pollution measured by annual average PM_{2.5} concentrations in urban areas, weighted by proportion of child population (0-19) living in urban areas



countries fail to meet this standard: the average level of urban air pollution to which children in urban areas are exposed exceeds the safety threshold. Canada's average level is 9.7, just below the safe level. However, some communities have more or less air pollution, at different times of the year. Air quality has been improving over the past decade in almost all high-income countries studied: the exceptions are Canada and Turkey, where there was a deterioration. This is something of a myth-buster for Canadians, many of whom assume we are much cleaner than the more urbanized European nations and our neighbour to the south. As urbanization continues its steady increase in Canada, continuing effort is needed to curb emissions from cars, power generation and industry. Some Canadian communities are affected by

air pollution originating in the United States, though the US has made significant progress to reduce urban air pollution and has a lower level on average than Canada.

NOTE: The trend data for figure 15 is incorrect; the text description correctly describes an increase in Canada's urban air pollution.

"Air pollution is getting worse?
I definitely thought it was getting better."

– Workshop Participant, age 16

CANADA AT THE BOTTOM

The indicators where Canada lags behind peer nations ring alarm bells. The high rate of relative income poverty and high levels of violence in children's lives are unacceptable.

They are associated with less food security, poor mental health and more unhealthy weight. They take a big toll on children's potential, blunt the capacity of families to thrive and generate large social and economic costs borne by all Canadians. Canada's performance in indicators that relate to child health may be surprising and concerning to those who might assume that universal health care translates to great child health outcomes across the board. It is encouraging that many child health outcomes in Canada, as in most high-income countries, continue to improve. Rates of neonatal mortality and adolescent "risk behaviour" such as drunkenness and teenage births have improved. But as in many wealthy countries, children's mental health seems to be eroding as income inequality has increased. In Canada, unlike many countries, there has been little progress to reduce teen suicide. A focus on children is fundamental to the attainment of sustainable

health and broader well-being because health problems in childhood can have a lasting impact throughout life.

The variation among wealthy countries is great among many of these indicators, particularly rates of child poverty, food insecurity, adolescent suicide and chronic bullying. One of the most telling indicators of the priority a country gives its children is its investment in them. Canada is one of the wealthiest of all nations, but invests less in children than many. However, the ship is turning with the generational Canada Child Benefit introduced in 2016 and more substantial provincial/territorial child-focused benefits. We hope this will help Canada advance up the league tables. But if we want to get to the top, we must continue to catch up by reducing violence and providing the universal public services children need.

GOOD HEALTH (GOAL 3)

— Canada ranks 29



Neonatal Mortality

Top performer:

JAPAN — 0.9 PER 1,000

Average:

2.8 PER 1,000

Canada:

3.6 PER 1,000

(RANKS 31)

Possibility Gap:

2.7 PER 1,000

Direction of change:

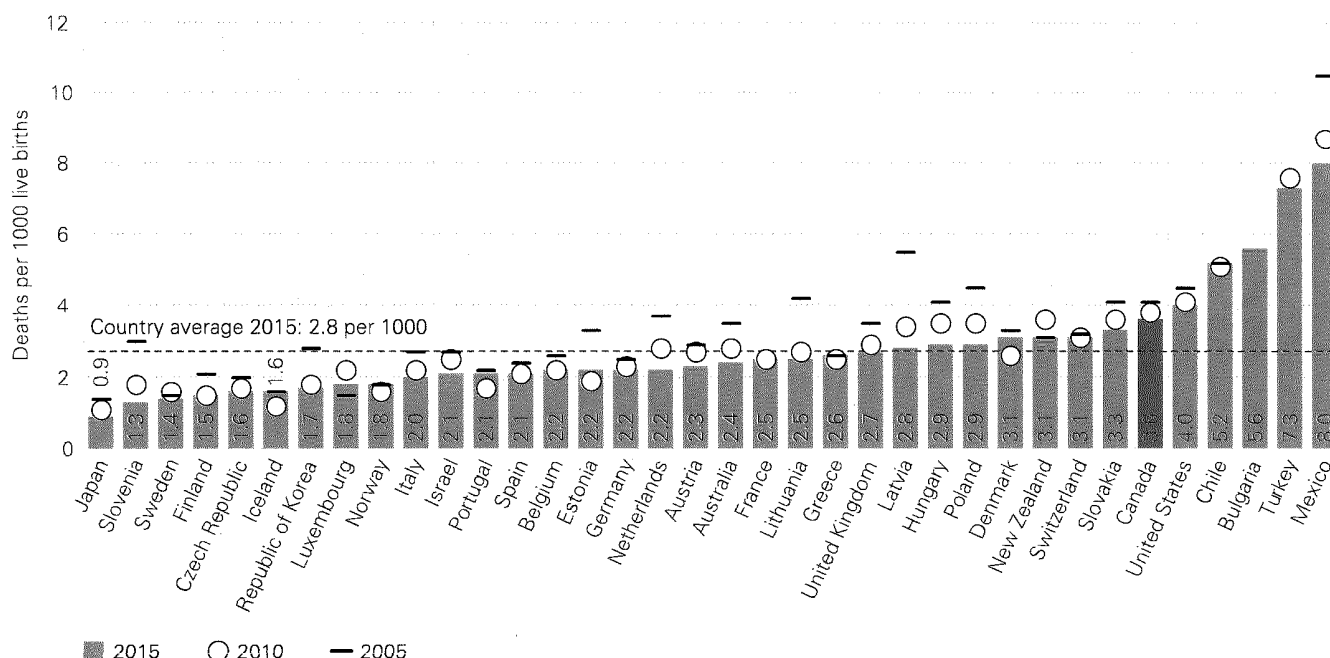
POSITIVE

(0.5 PER 1,000)

The first prerequisite of child well-being is to ensure that as many children as possible survive the first year of life. The neonatal mortality rate, which tracks deaths in the first four weeks of life, is an official SDG indicator under

target 3.2. All high-income countries have reduced their neonatal mortality rates below the global target of 12 deaths per 1,000 live births, although averages in some countries hide stark differences between different social

groups. Neonatal mortality continues to fall but figure 3.1 suggests that there is still room for improvement. In 2015, an average of 2.8 children per 1,000 were dying in the first four weeks of life across rich countries. Japan has set a

Figure 16: Neonatal mortality rates (deaths in the first 28 days of life, per 1,000 live births)

new historic benchmark by achieving a neonatal mortality rate of 0.9 per 1,000, despite having the highest percentage of low-weight births in the OECD (a high rate of low birth weight is also a concern in Canada).¹⁶

Canada is above the rich-world average for neonatal mortality at 3.6 per 1,000. A Canadian study suggests that national differences in the registration of premature, very early gestation births call for caution in interpreting international rankings of neonatal mortality (Joseph et. al., 2012). It is not resolved how much of the difference in Canada's ranking is attributable

to different registration practices, and therefore how much of a public health gap Canada has. U.S. studies have found that the main reason for higher infant mortality rates when compared with European nations is a very high percentage of preterm births, rather than differences in registration practices (MacDorman & Mathews, 2009). In Canada, preterm births account for two-thirds of infant deaths. Preterm births are generally linked to low income and social exclusion, and are a sensitive indicator of overall population health.

Another way to examine progress is the rate of reduction of neonatal mortality. Canada's rate continues to decline, but Australia and the Netherlands have made substantial progress despite having already relatively low mortality rates. Over time, Canada's rankings in international comparisons have fallen. The social determinants of pregnancy outcomes in Canada, including the impact of poverty, and the wide regional variations across Canada, call for continuing momentum to reduce infant mortality.

16 See OECD Family Database 2016: https://www.oecd.org/els/family/CO_1_3_Low_birth_weight.pdf.

Teen Suicide

Top performer:

PORTUGAL — 1.7 PER 100,000

Average:

6.1 PER 100,000

Canada:

8.5 PER 100,000

(RANKS 31)

Possibility Gap:

6.8 PER 100,000

Direction of change:

POSITIVE

(0.2 PER 100,000)

In high-income countries, suicide is generally the leading cause of death among young people of both sexes after accidents, accounting for 17.6 per cent of all deaths. Figure 17 reflects the suicide rate for adolescents aged 15-19. The rate is lowest, at 1.7 per 100,000, in Portugal, and tends to be low in southern European countries. The highest rate, of 15.6 per 100,000, is in New Zealand. In Canada, the rate of 8.5 is above the average of 6.1 per 100,000.

Across the board, boys are more likely to die by suicide than girls – three times more likely, on average. Girls attempt suicide around twice as often as boys, though they generally choose methods that are less lethal (Beautrais, 2003; Bridge et al., 2006). In Canada,

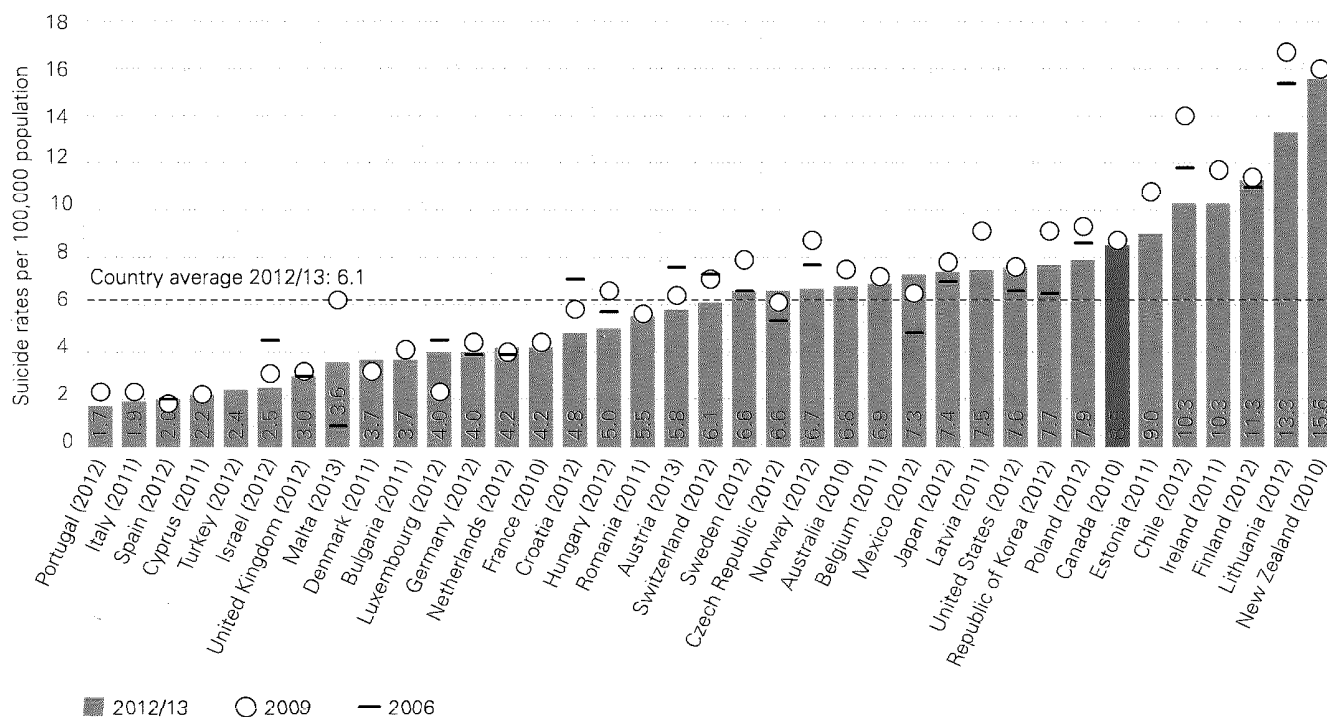
rates of suicide among Indigenous children are much higher than the average. In many countries, children who identify as LGBTIQ2S also have higher than average rates.

Adolescent suicide rates have fallen in the majority of countries in recent years. It is concerning that the rate in Canada remains relatively unchanged. In six countries, the suicide rate rose. In a handful of countries including the Netherlands, New Zealand and the United States, girls' suicide rates increased while the rates for boys declined. Cultural differences make comparing rates across countries challenging in the search for solutions. As an outcome of severe emotional and spiritual crisis or poor mental health, in response to personal as

well as cultural contexts, like many health indicators the solutions lie in broader social conditions as well as individual supports. Untreated Depression significantly increases the risk of suicide. Even though effective treatments are available, most Canadian youth with Depression do not seek appropriate treatment or have efficient access to appropriate care, because we don't make it easy or appealing. Pathway Through Care and WellAhead are child-centred initiatives that focus on simple, innovative methods for promoting mental health and integrating mental health literacy and access to treatment in schools.¹⁷ Culturally appropriate programs for Indigenous youth are critical.

17 See <http://teenmentalhealth.org/pathwaythroughcare/> and <http://www.mcconnellfoundation.ca/kh/programs/child-and-youth-wellbeing>.

Figure 17: Adolescent suicide rates (aged 15-19 per 100,000 population based on the latest available data, 2008-2013)



“Teen suicide and social transfers for kids are related.”

– Workshop Participant, age 17

Teen Mental Health

Top performer:

GERMANY — 14.2%

Average:

23.1%

Canada:

22.0%

(RANKS 14)

Possibility Gap:

7.8

PERCENTAGE POINTS

Direction of change:

NEGATIVE

(0.2 PERCENTAGE POINTS)

Mental health is included in SDG target 3.4. The Health Behaviour in School-aged Children (HBSC) survey provides a non-clinical, self-reported measure of adolescent mental health. Every four years, schoolchildren aged 11-15 in a large number of countries are asked how often they experience each of four symptoms: feeling low, irritability, nervousness and sleeping difficulties (see figure 18).

An average of 1 in 4 adolescents (23 per cent) reports experiencing two or more psychological symptoms more than once a week, ranging from the lowest incidence of 14 per cent in Germany to the highest of 36 per

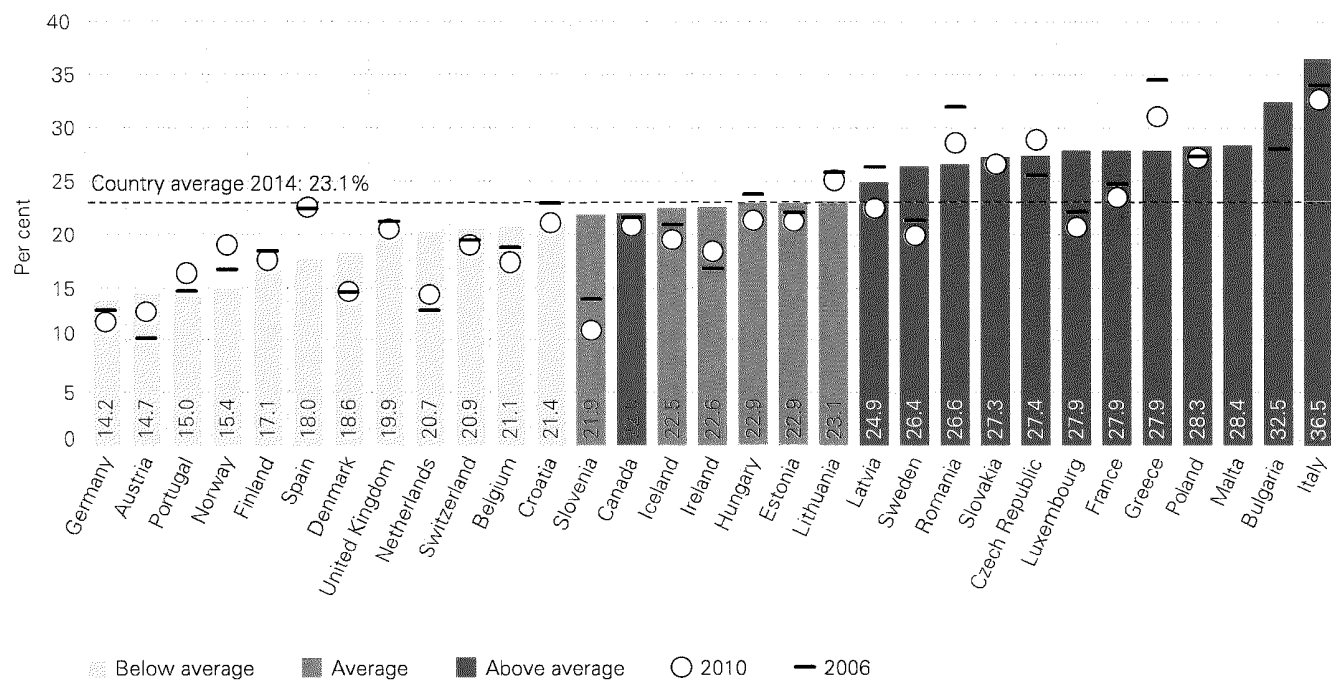
cent in Italy. The rate in Canada is 22 per cent, close to the average of 23 per cent. Girls are much more likely to report symptoms related to their mental health than boys, with the gap widening as they become older.

Unlike many health indicators, the reporting of mental-health issues is on the rise in many high-income countries: 13 of the 29 countries surveyed had an increase of more than two percentage points in self-reported symptoms between 2010 and 2014, with particularly large increases in Slovenia, Luxembourg, Sweden and the Netherlands. In Canada, the rate has remained fairly stable. If left untreated,

mental-health disorders that emerge prior to adulthood impose a 10-fold higher health cost than those emerging later in life (Lee et al., 2014).

There is a manifest need for more objective, standardized, international data on adolescent mental health in high-income countries – as well as sharing of positive initiatives that can help determine future policy. The Public Health Agency of Canada in partnership with the Mental Health Commission of Canada recently released a more comprehensive set of indicators that include not only clinical data, but also child and youth self-reported mental health.

Figure 18: Adolescent mental health issues (percentage of adolescents reporting two or more psychological symptoms – feeling low, irritability, nervousness, and sleeping difficulties – more than once a week)



"We're generally a very 'happy' country so we should be ranking at the top of most categories, right?"

– Workshop Participant, age 16

Teen Drunkenness

Top performer:

ICELAND — 1.7%

Average:

6.9%

Canada:

7.2%

(RANKS 17)

Possibility Gap:

5.5

PERCENTAGE POINTS

Direction of change:

POSITIVE

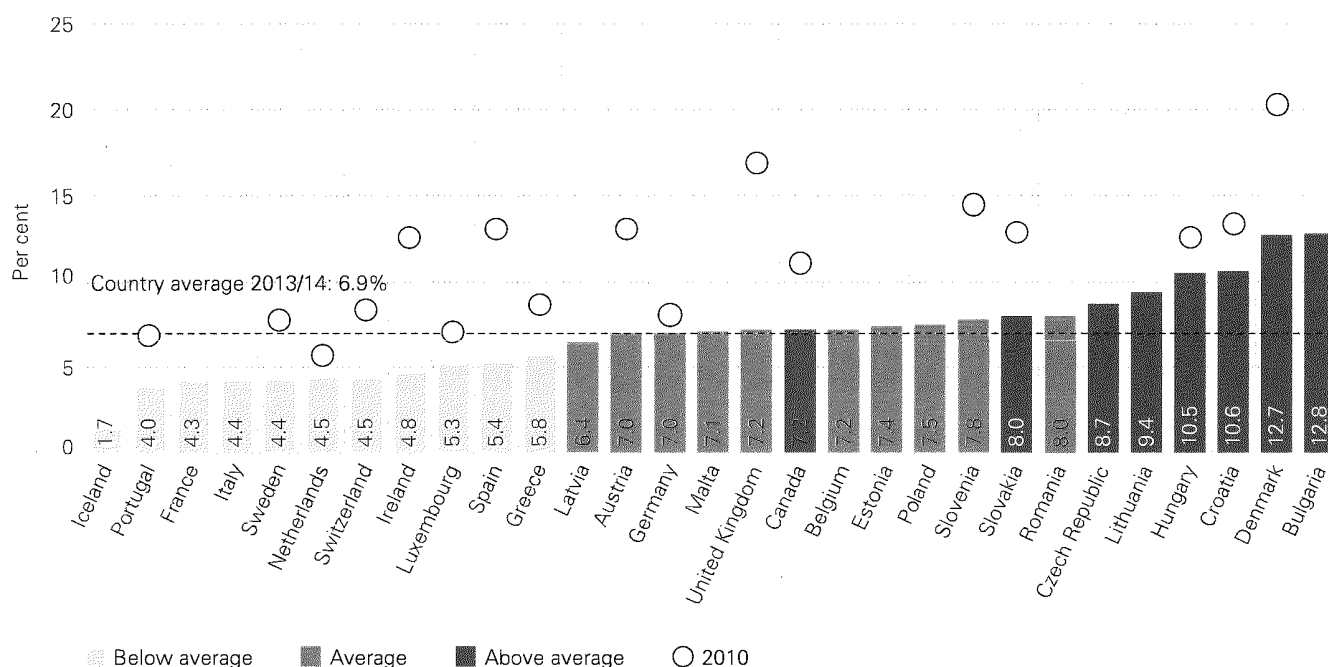
(4.1 PERCENTAGE POINTS)

Target 3.5 of the SDGs aims to “strengthen the prevention and treatment of substance abuse, including... the harmful use of alcohol.” Although the official indicator focuses on adults, drinking by children is also a matter of public concern in many high-income countries, not least because of the association with injuries (de Looze et al., 2012; Pickett et al., 2005).

Figure 19 shows the percentage of schoolchildren aged 11-15 in each country who reported having been drunk in the previous 30 days. There is substantial variation between countries, with a low in Iceland of 2 per cent. Canada’s rate of 7 per cent is just above the average. In most countries, the incidence of adolescent drunkenness declined between 2010

and 2014. In some countries, the improvement was dramatic: in Ireland, Spain and the United Kingdom, the rate more than halved, and Canada has made significant progress as with other forms of adolescent “risk behaviour” such as cannabis use and smoking.

Figure 19: Adolescent drunkenness (percentage aged 11-15 who reported having been drunk in the previous month)



There is no greater priority for any nation than the well-being of its children. It's up to all of us – individual Canadians, the private sector and all levels of government – to come together and ensure all of our children from coast to coast to coast are safe, healthy, educated and have dreams for their futures – dreams they can achieve.

**– David Morley, UNICEF Canada
President and CEO**

Teen Births

Top performer:

KOREA — 1.6 PER 1,000

Average:

13.3 PER 1,000

Canada:

9.5 PER 1,000

(RANKS 23)

Possibility Gap:

7.9 PER 1,000

Direction of change:

POSITIVE

(4.7 PER 1,000)

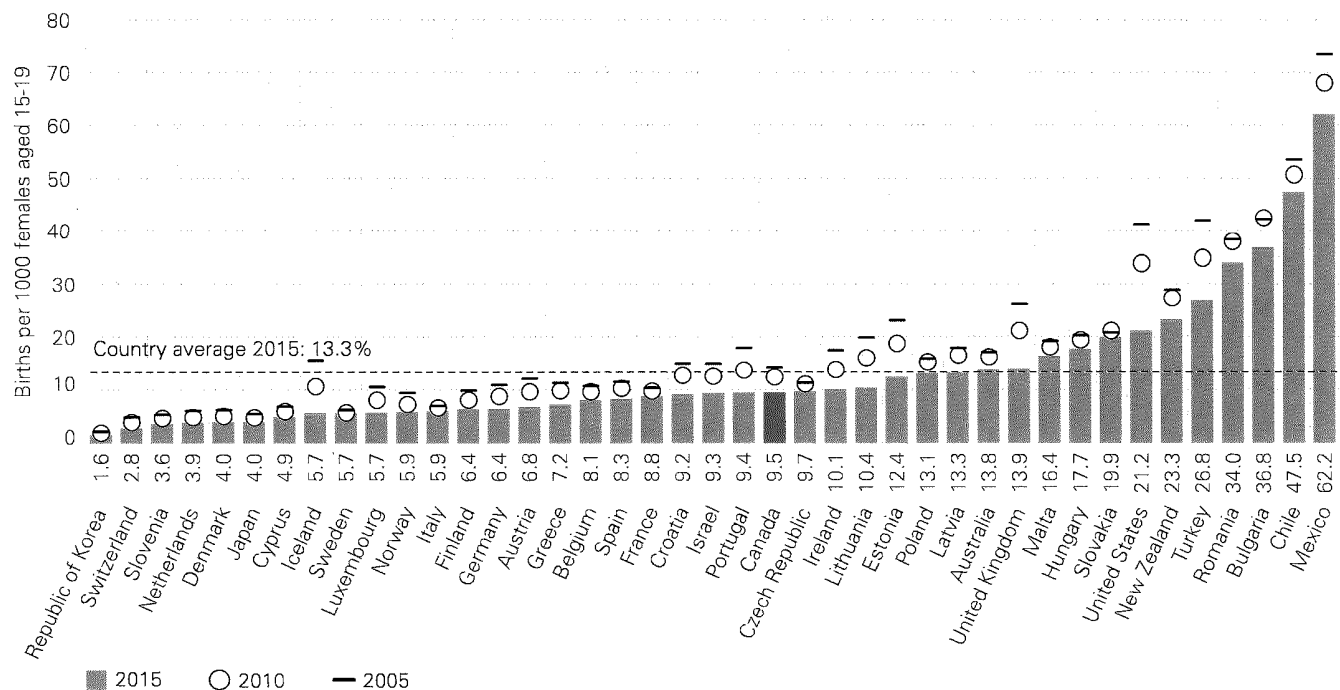
Reducing the adolescent birth rate is a target for global health due to the high individual and social costs associated with teenage pregnancies and births. Very young mothers face higher risks of mortality and birth complications affecting the survival and health of their children, in addition to the likely adverse impact on their own economic opportunities. Preventing early pregnancies can therefore improve the life chances and health prospects of two generations of children.

Figure 20 tracks the number of births per 1,000 women aged 15-19, with wide variation among wealthy countries. The lowest teenage birth rate is found in the Republic of Korea, with 1.6 per 1,000, while five other countries – Denmark, Japan, the Netherlands, Slovenia and Switzerland – have a rate of 4 or fewer per 1,000. The rate in Canada is 9.5, significantly above the best-performing countries but below the average of 13.3.

Without exception, all countries show a decline in the teenage birth rate between 2005 and 2015. The progress has been particularly marked in Iceland, which reduced its rate by 63.5 per cent over that period, but 10 countries reduced their rates in excess of 40 per cent and Canada's rate of decline has also been significant. It is not entirely clear why adolescent "risk behaviour" is generally on the decline, but public health approaches and higher opportunity and social costs may be having an influence.

"We have a bad sex-ed, it's not talked about enough."

– Workshop Participant, age 16

Figure 20: The adolescent birth rate (number of births per 1,000 females aged 15-19)

Data Pothole

Goal 3, focused on health, includes a number of indicators relevant to children and youth that should be monitored in high-income countries including coverage of substance abuse treatment, access to family planning, affordable medicine and vaccination. Injuries and tobacco use should also be tracked for this Goal. In Canada, vaccination rates are not adequately measured, though progress is being made. While Indigenous children have outcomes in these areas that are typically worse than the average, some SDG indicators address health conditions that should not be prevalent in a high-income country like Canada but are particularly acute in some Indigenous communities including tuberculosis, ambient air pollution (including indoors) and unsafe water and sanitation.

NO POVERTY (GOAL 1) — Canada ranks 32



Child Income Poverty

Top performer:

DENMARK — 9.2%

Average:

21.0%

Canada:

22.2%

(RANKS 24)

Possibility Gap:

13

PERCENTAGE POINTS

Direction of change:

POSITIVE

(1.8 PERCENTAGE POINTS)

There are wide variations in child poverty rates across rich countries. The rate and depth of child poverty have worsened in many countries since the onset of the Great Recession, more than poverty among other age groups. Canada's rate has slightly improved in the last few years, but remains stubbornly high in contrast to many of our peer nations.

The universal standard measures of poverty are based on income. SDG indicator 1.2.1 aims to measure the proportion of people living below the national poverty line – including the share of children. Most high-income countries measure the risk of child poverty as a level of family income

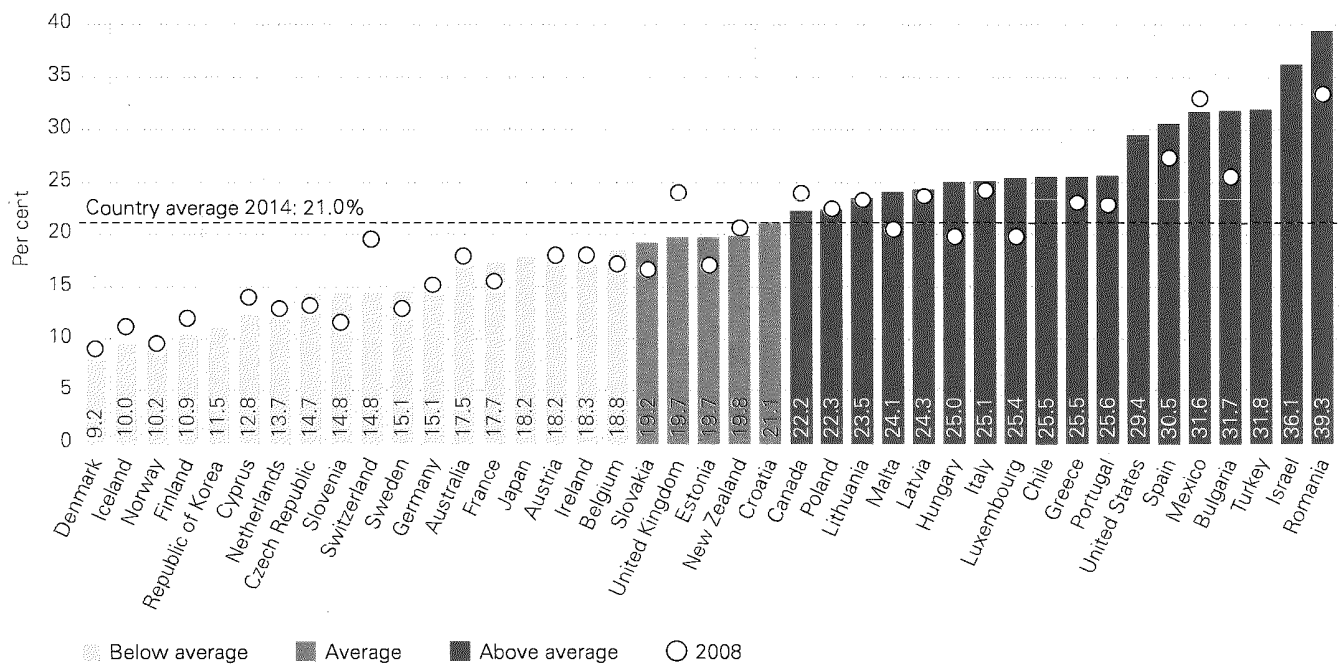
60% of the median. On average, 1 in 5 children (from birth to age 17) in high-income countries lives in poverty, though there is wide variation, from only 1 in 10 in Denmark, Iceland and Norway to 1 in 3 in Israel and Romania (see figure 21). Canada's level of child poverty is close to the average of 1 in 5.

Living in poverty and deprivation during childhood creates inequalities in child development and health that show up by the time children start school, and can yield lifelong damage, with proven effects on health and educational attainment.¹⁸ These impacts can evolve into large earnings differences in adulthood (Heckman & Savelyev, 2013). Canada's federal innovation

agenda aims to attract immigrants to sustain and grow social and economic prosperity. To increase human capital, closing the inequality gaps among Canada's children will be just as important. Most of Canada's provinces and territories have targets to reduce the rate of child income poverty; they may soon be joined by the federal government. Children in Canada are poorer than any other group, at a developmental stage when it has a very significant impact; they must be a priority for new targets and measures to continue to shore up the incomes of Canadians as called for by Campaign 2000 (Campaign 2000, 2016).

¹⁸ See, for example: UNICEF, *The State of the World's Children 2005*, p. 17; Hackman, D.A., & Farah, M.J. (2009). Socioeconomic status and the developing brain. *Trends in Cognitive Sciences*, 13, 65–73. <https://doi.org/10.1016/j.tics.2008.11.003>

Figure 21: Relative income poverty (percentage of children aged 0-17 living in households with incomes lower than 60% of the median, 2014 and 2008)



NOTE: The relative child poverty rate measures the proportion of children living in a household where disposable income is less than 60% of the national median (after taking taxes and benefits into account and adjusting for family size and composition using the OECD modified equivalence scale).

Social Transfers for Children

Top performer:

FINLAND — 66%

Average:

37.5%

Canada:

21%

(RANKS 29)

Possibility Gap:

45

PERCENTAGE POINTS

Direction of change:

NO CHANGE

If child poverty rates were entirely dependent on market household incomes, they would be much higher across the board. Instead, governments intervene through benefits and taxes to reduce poverty and income inequality. Social transfers to families with children can be highly effective in reducing relative child poverty, as figure 22 reveals. On average, social transfers in high-income countries reduce child poverty rates by about one-third. In 11 countries, social transfers more than halve child poverty, and Finland, Iceland and Norway cut child poverty

rates by up to two-thirds of the market rate. The league table is based on 2014 data prior to the implementation of the federal Canada Child Benefit (CCB) in July 2016, so Canada's rank of 29 based on a child poverty reduction rate of 21 per cent (well below the average of 37 percent) doesn't capture its impact.¹⁹ The impact of the CCB on Canada's ranking will be measurable after 2017, but David Macdonald of the Canadian Centre for Policy Alternatives estimated its hypothetical impact (if applied in 2014).²⁰ Had the CCB been implemented in 2014, it would have reduced the child poverty

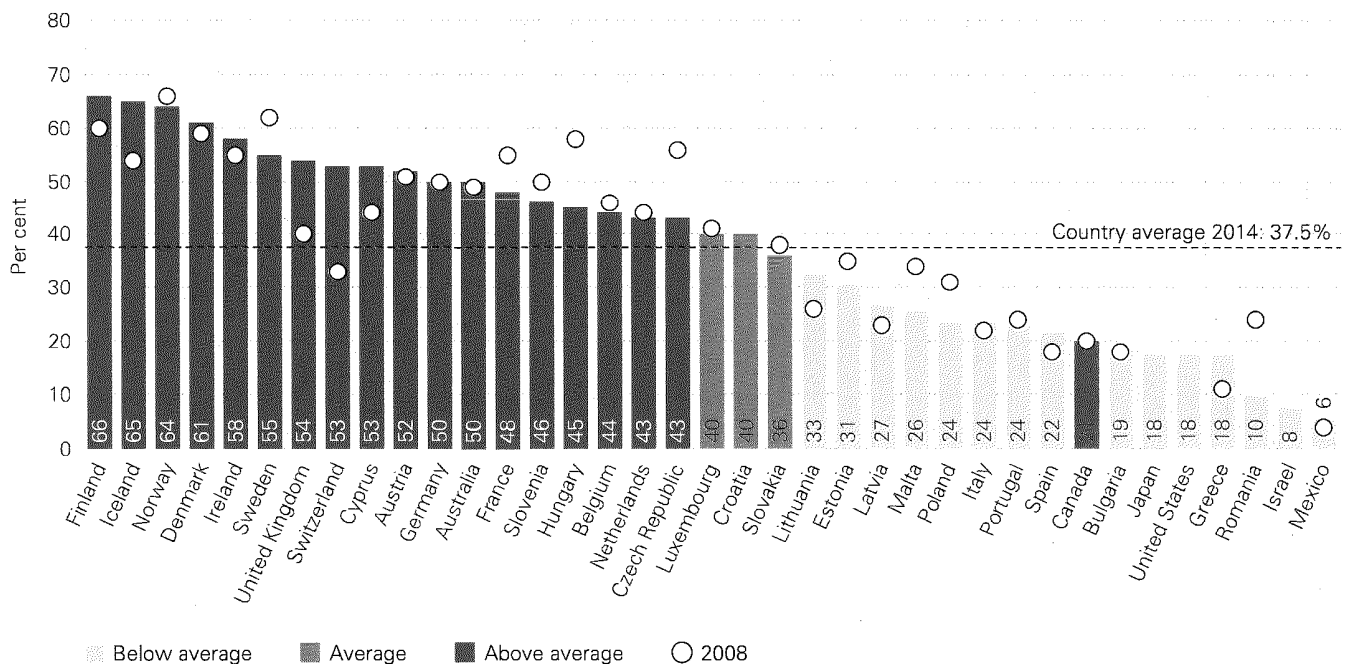
rate by 38 per cent (the average rate among wealthy nations) and improved Canada's ranking to 20th place.²¹ Even with the CCB, considerable room remains for more improvement in social transfers by federal, provincial and territorial governments to help achieve better child well-being outcomes. At minimum, Canada's CCB payments need to be indexed to inflation (prior to 2020) and protected within a legislated federal child poverty reduction strategy.

19 In July 2016, the Canada Child Tax Benefit, the National Child Benefit Supplement and the Universal Child Care Benefit were rolled into a new Canada Child Benefit that provided more benefit particularly to lower- and middle-income families. Estimates from SPSP/M 22.3 as calculated on request of UNICEF Canada by David Macdonald, Senior Economist with the Canadian Centre for Policy Alternatives in May 2017. A similar calculation of the impact of social transfers (excluding the CCB) based on Canadian Income Survey Public Use Microdata File (2014) yields a child poverty reduction of 17%, which would not alter Canada's ranking. The difference in poverty reduction is due to the difference in transfer payments between the data sources.

20 Using Statistics Canada's tax modelling software (SPSP/M).

21 As calculated by David Macdonald using SPSP/M 22.3 for 2014. The scenario assumes the cancellation of the UCCB, NCBS and CCTB and the implementation of the CCB at the initial rates and income levels as reflected in Budget 2016 but applied to the 2014 year.

Figure 22: Effectiveness of social transfers (percent reduction in the rate of child poverty due to social transfers, 2014 and 2008)



NOTE: Reduction in child poverty is measured as a proportional difference between child poverty rates before and after social transfers. Child poverty rates are measured using income thresholds at 60% of the median household income of the total population. The capacity of income benefits or transfers to reduce child poverty depends on multiple factors including their size and targeting, and the initial levels of pre-transfers child poverty. The roles of taxes and other social programs are not considered here.

Data Pothole

Multidimensional Child Poverty: Family income is only one, though an important, indicator of the risk of poverty and deprivation. Children also rely on quality public services that money can't buy, and a sizeable proportion of children with family incomes above the monetary "poverty line" are deprived in material and other aspects of well-being (a fairly consistent pattern where multidimensional measures are used). The SDGs call for a reduction "at least by half [of] the proportion of men, women and children living in poverty in all its dimensions according to national definitions." UNICEF has developed the Multiple Overlapping Deprivation Analysis (MODA) tool to measure multidimensional deprivation among children. It is based on the conditions for children established in the Convention on the Rights of the Child (CRC), though there are a variety of methodologies, and variables may include nutrition, clothing, education, health care, social activities and quality of housing. If we asked young people, many would include access to high-speed Internet, which is an SDG indicator of social and economic inclusion. Children who are deprived in a certain number of these policy-relevant dimensions are considered to be in "multidimensional child poverty" (Chzhen, Bruckauf, & Toczydlowska, 2017). Most high-income countries and 40 lower-income countries have made a commitment to monitor multidimensional child poverty. Canada remains an outlier, without a measure of multidimensional poverty at any level of government to help guide investments, policies and services to the areas in which children are deprived. All levels of government in Canada should use MODA as part of their poverty reduction strategies to better reveal which children are deprived and in what ways.

Data Pothole

Goal 1 calls on governments to measure the adequacy of their investment in people according to the proportion of the budget allocated to poverty reduction programs and to spending on essential services (indicators 1.a.1, 1.a.2 and 1.b.1). They should also measure the proportion of the budget spent on children and youth as called for by article 4 of the Convention on the Rights of the Child.

FOOD SECURITY AND NUTRITION (GOAL 2)

— Canada ranks 37

**Children's Food Security****Top performer:****JAPAN — 1.4%****Possibility Gap:****10.5**

PERCENTAGE POINTS

Average:**12.7%****Canada:****11.9%**

(RANKS 24)

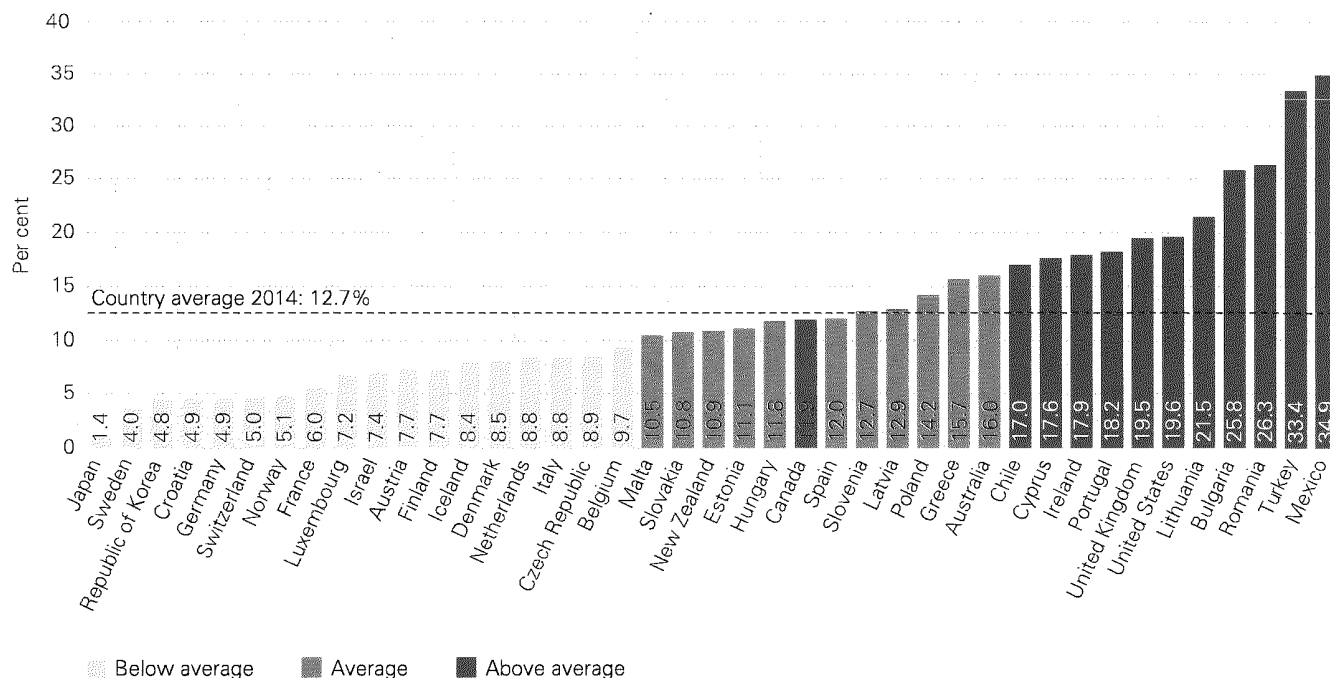
Direction of change:²²**N/A**

Food security is a target for SDG Goal 2 to end hunger and ensure access to safe, nutritious and sufficient food that can ensure normal growth and development. Measuring the prevalence of moderate or severe food insecurity among children under the age of 15 is a partial indicator, for which internationally comparable data is available. According to this, some countries are doing much better than others, as figure 23 reveals. Rates of food insecurity among children vary widely from less than 2 per cent in Japan to more than 30 per cent. At 12 per cent, Canada is close to the average, but this average

masks higher food insecurity for some children, particularly in low-income families and among homeless youth and northern Indigenous communities. Canadian data show that food insecurity disproportionately affects households with children under age 18 (Tarasuk, Mitchell, & Dachner, 2014). In 2012, an estimated 1.15 million Canadian children under 18 lived in households that were struggling to afford the food they need.²³ Nationally, 1 in 6 children are exposed to some level of household food insecurity, but the rate is even higher in the Maritimes and the North. Most concerning is Nunavut,

where 62 per cent of children under 18 were in food-insecure households in 2012 – literally off the chart below. Food insecurity affects learning and social functioning and has impacts on mental and physical health, increasing children's risks of a variety of chronic health problems including Depression and asthma. No level of food insecurity among children is acceptable given Canada's ample resources. Addressing food insecurity among families with children means, first and foremost, ensuring that all families have sufficient financial resources to meet their basic needs.

Figure 23: Food insecurity (share of children below the age of 15 living with a respondent who is food insecure, 2014/15)



“Healthy nutritious meals are expensive, more than junk food.”

– Workshop Participant, age 16

- 22 Available data suggest that in most parts of Canada, food insecurity in 2012 remained at or above the levels experienced in prior years (Tarasuk, Mitchell, & Dachner, 2014).
- 23 Internationally comparable time-series data were not available. Available data suggest that food insecurity in most parts of Canada has persisted or increased over the past decade, with significant improvement in Newfoundland and Labrador (Tarasuk, Mitchell, & Dachner, 2013).

Unhealthy Weight

Top performer:

DENMARK — 8.3%

Average:

15.2%

Canada:

25.0%

(RANKS 29)

Possibility Gap:

16.7

PERCENTAGE POINTS

Direction of change:

NEGATIVE

(3.9 PERCENTAGE POINTS)

Target 2.2 of the SDGs is to end all forms of malnutrition by 2030. The main focus is on ending stunting and wasting in very young children in low-income countries, but the indicators track overweight as well as underweight. Figure 24 shows that unhealthy weight among children (between ages 11-15) is a pressing challenge across high-income countries. All but four countries have child overweight and obesity rates above 10 per cent. With a rank of 29 out of 30 countries, Canada's rate of

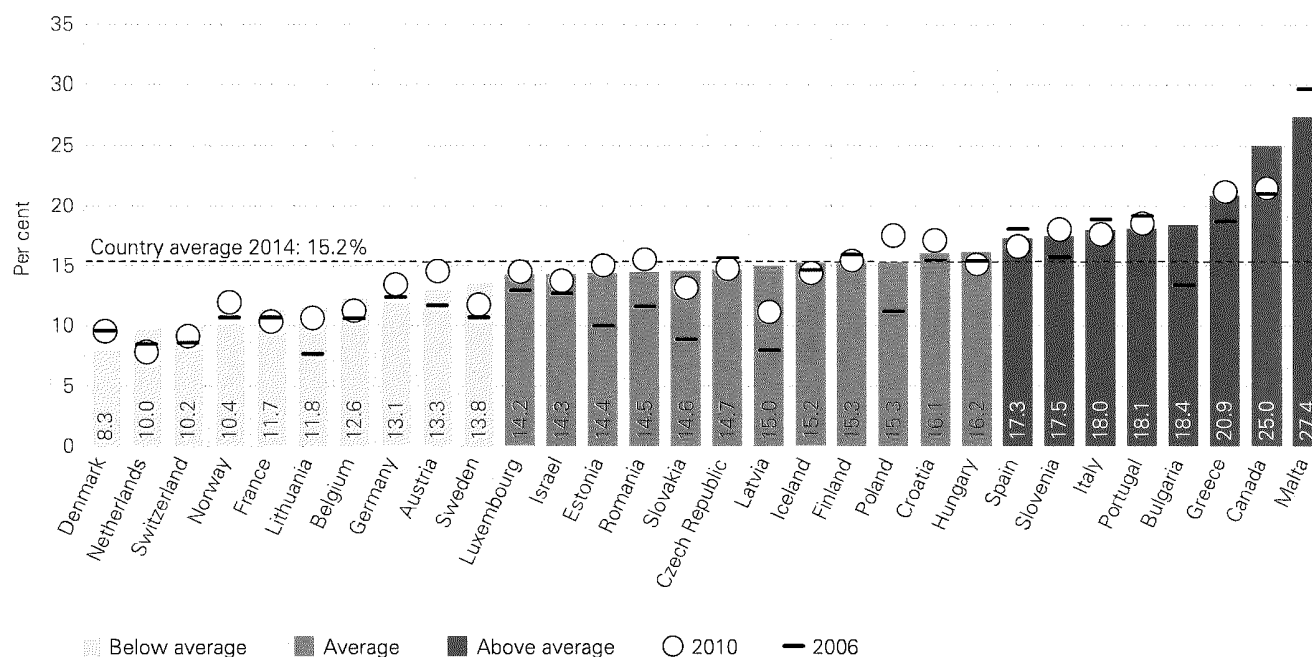
25 per cent, or 1 in 4 children, is well above the average of 15 per cent. The healthiest country in this respect is Denmark, where the rate has fallen to less than 10 per cent from already low levels. Unhealthy weight is not necessary baggage in a wealthy, urbanized country.

Obesity has been linked to multiple health conditions in childhood, to lower self-esteem, and to a heightened risk of cardiovascular diseases and diabetes in adulthood. Food insecurity

and obesity tend to affect children at the bottom of the income scale more than others. Lifting children out of poverty and reining in overall income inequality will help to boost nutrition and health. The federal government's commitment to curb marketing to children of unhealthy food and beverages is a welcome effort to address this stubborn and very costly problem. A school nutrition program could also contribute to improvements in children's healthy eating.

"Canada has lots of fast food, it's much cheaper."

— **Workshop Participant, age 17**

Figure 24: Rates of obesity (1-15 year olds who are obese or overweight, 2014/15)

Food insecurity affects learning and social functioning and has impacts on mental and physical health, increasing children's risks of a variety of chronic health problems including Depression and asthma. No level of food insecurity among children is acceptable given Canada's ample resources.

Breastfeeding (at 6 months)**Top performer:****NORWAY — 71%****Possibility Gap:****41**

PERCENTAGE POINTS

Average:**45%****Canada:****30%**

(RANKS 18)

Direction of change:**N/A**

Good nutrition starts from birth. Breastfeeding contributes to SDGs related to nutrition and health. WHO and UNICEF recommend exclusive breastfeeding for six months. However, most mothers in high-income countries stop breastfeeding before six months. Given this context, it is worth measuring breastfeeding rates in high-income countries, especially as this is one of the few positive health indicators in which rich countries tend to lag behind poorer ones.²⁴

Although some of the data are relatively old and do not refer to exclusive breastfeeding, the results indicate that the proportion of mothers who start to breastfeed is now high in almost all high-income countries. But by the time an infant is six months old, between a third and a half are no longer breastfed. In Canada, like Greece and the United Kingdom, the drop-off rate is more substantial, from close to 90 per cent at initiation to 30 per cent at six months.

Breastfeeding is relatively free of cost, and is higher where there are stronger social and workplace policies including maternity leave. All infants in Canada should have access to Baby-Friendly Initiative services following the examples set by the governments of Quebec, Ontario, Manitoba and others, together with the Breastfeeding Committee for Canada. As in many child health indicators, these efforts swim upstream against the broad social influence of income inequality and its attendant impacts.

Breastfeeding is relatively free of cost, and is higher where there are stronger social and workplace policies including maternity leave. All infants in Canada should be covered by Baby-Friendly Initiative commitments following the examples set by the governments of Quebec, Ontario, Manitoba and others, together with the Breastfeeding Committee for Canada.

²⁴ The data were gathered for the EU Statistics on Income and Living Conditions survey (EU-SILC).

Figure 25: Breastfeeding rank/rate estimates in high-income countries

Country	Reference year	Estimates by time and prevalence		
		Ever breastfed	At 6 months	At 12 months
Australia	2010	8	7	8
Austria	2006	7	13	15
Canada	2011/12	10 (89%)	18 (30%)	19 (9%)
Chile	2011/12	3	15	13
Czech Republic	2005	2	13	15
Denmark	2013		21	22
Finland	2010	8	6	7
France	2012/13	18	19	19
Germany	2009/12	14	9	11
Greece	2007/08	11	20	21
Ireland	2012	19		23
Italy	2013	13	12	14
Japan	2009	3	2	2
Korea	2012	11	4	3
Mexico	2012			4
Netherlands	2006/08		17	18
New Zealand	2006		5	4
Norway	2013	3	1 (71%)	6
Spain	2011	17	11	11
Sweden	2010	1 (98%)	8	15
Switzerland	2003	6	3	9
Turkey	2008			1 (74%)
United Kingdom	2005/10	15	16	24
United States	2011	16	10	10
Average (From Actuals)		86	45	25
CDA Distance from Average		3	-15	-16
CDA Distance from Top Performer		-9	-41	-65

NOTE: Breastfeeding rates are not exclusive breastfeeding rates. The league table is only indicative, as data are from different years and therefore not directly comparable.

Figure 26: League table of breastfeeding rates

Country	Average ranking of breastfeeding at all time periods
Turkey	1
Japan	2
Norway	3
Mexico	4
New Zealand	5
Korea	6
Switzerland	6
Finland	8
Australia	9
Sweden	10
Czech Republic	11
Chile	12
Germany	13
Austria	14
United States	15
Italy	16
Spain	16
Canada	18
Greece	19
Netherlands	20
United Kingdom	21
France	22
Ireland	23
Denmark	24

Based on the average ranking of breastfeeding rates: ever breastfed, at 6 months and at 12 months

PEACE, JUSTICE AND STRONG INSTITUTIONS (GOAL 16)

— Canada ranks 37



Child Homicide

Top performer:

MALTA — 0.00 PER 100,000

Average:

0.65 PER 100,000

Canada:

0.90 PER 100,000

(RANKS 33)

Possibility Gap:

0.90 PER 100,000

Direction of change:

POSITIVE

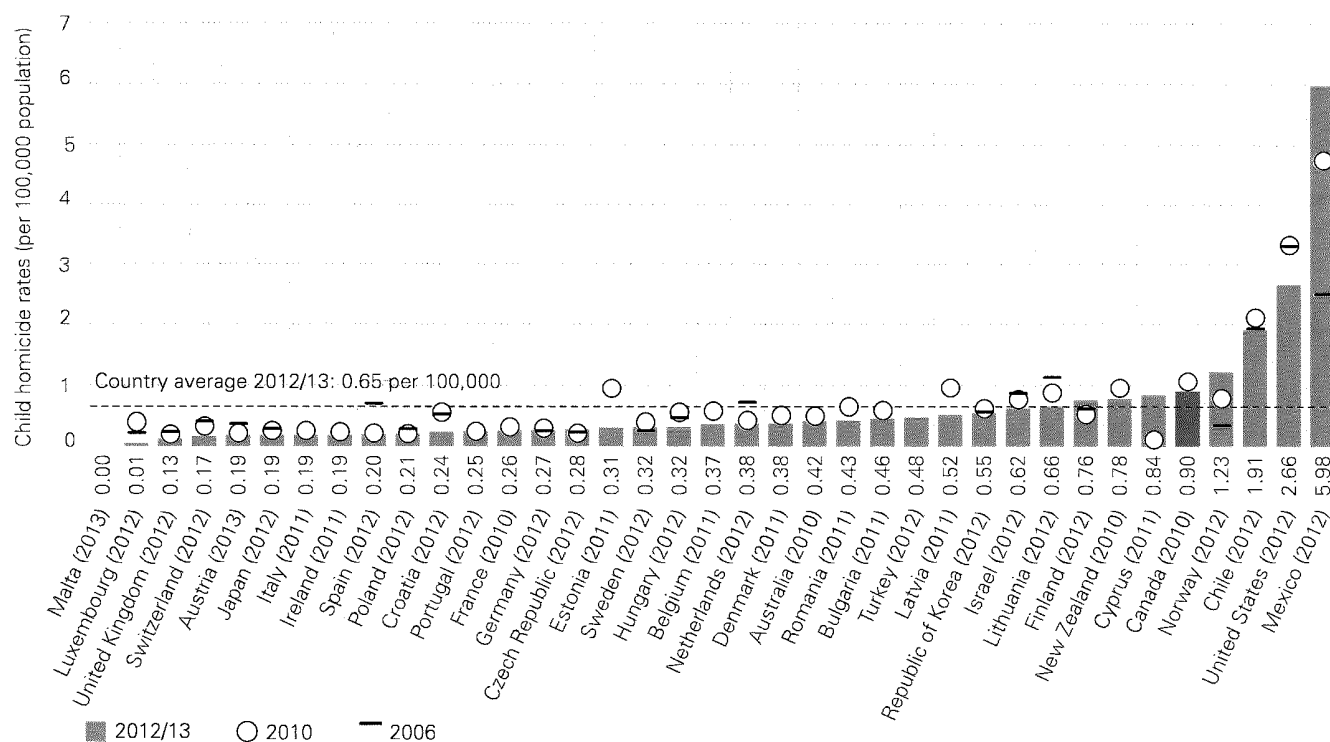
(0.17 PER 100,000)

Perhaps one of the most disturbing SDG indicators is the child homicide rate. Goal 16 includes indicator 16.1.1, which tracks the rate of intentional homicides per 100,000 people. Figure 27 adapts this to show the child homicide rate in high-income nations. All high-income countries have to address rates of violence affecting children as they seek to develop peaceful and inclusive societies. Child homicide is a “tip of the iceberg”

indicator of social violence. While the international average for the countries included is 0.65 deaths per 100,000 children, Canada’s rate is 0.9 – the fifth highest. Children make up a substantial proportion of the victims of homicide in Canada, estimated at 1.5 per 100,000 annually (closer to 7 per 100,000 among Indigenous females).²⁵ Child homicide is the fourth leading cause of death among young people aged 1-24, after accidents,

suicide and cancer (Statistics Canada, 2017). It is unacceptable, but at least the child homicide rate has declined steadily along with the overall homicide rate. However, Canada also sustains comparatively high rates of violence against children in other forms “below the tip,” including the much more prevalent form of bullying. These forms of violence have been more persistent over time.

25 From Conference Board of Canada. (2017). How Canada Performs Report Card: <http://www.conferenceboard.ca/hcp/default.aspx>.

Figure 27: Child-homicide rate (deaths of children aged 0-19 by intentional assault per 100,000)

All high-income countries have to address rates of violence affecting children as they seek to develop peaceful and inclusive societies. Child homicide is a “tip of the iceberg” indicator of social violence.

Bullying

Top performer:

SWEDEN — 4.5%

Average:

10.8%

Canada:

15.0%

(RANKS 27)

Possibility Gap:

10.5

PERCENTAGE POINTS

Direction of change:

NEGATIVE

(0.9 PERCENTAGE POINTS)

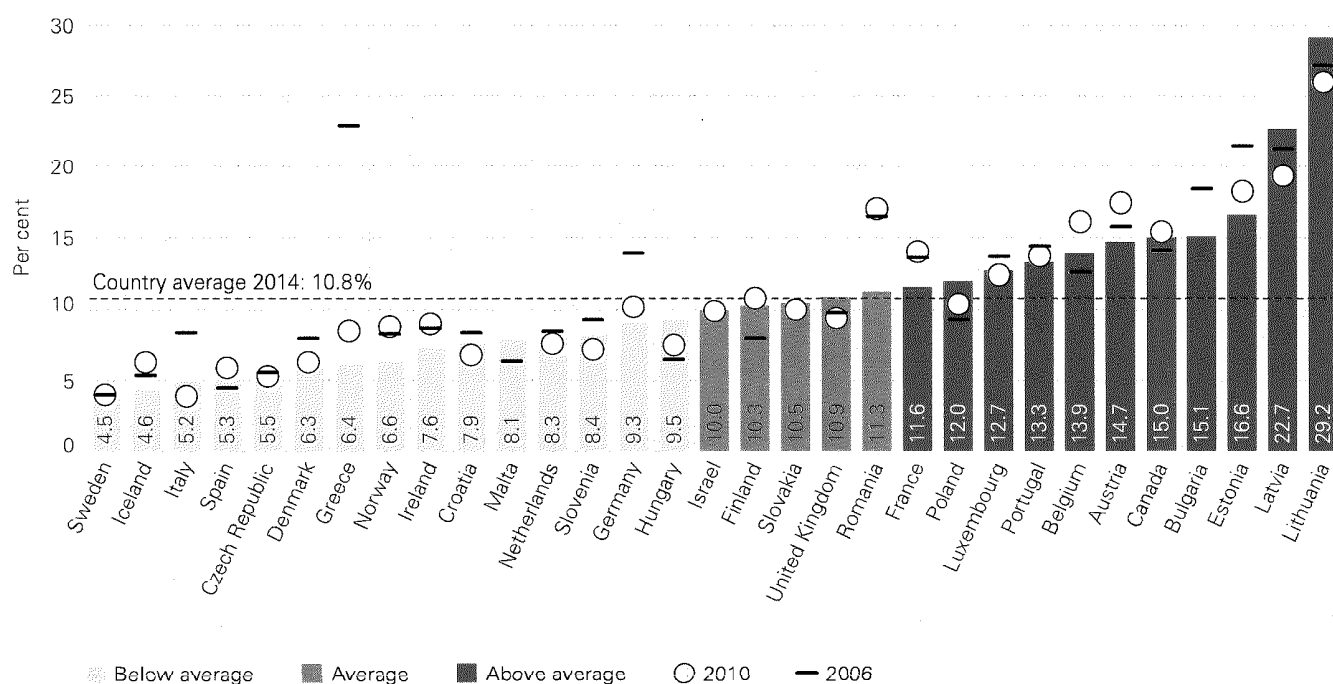
Bullying includes emotional and psychological as well as physical violence. It is linked to ill health, low self-esteem, poorer educational outcomes, Depression and thoughts of suicide (UN Special Representative of the Secretary-General on Violence against Children, 2016). Figure 28 gives some indication of the scale of the problem, showing the proportion of children aged 11-15 who reported having experienced bullying at school 2 or more times a month. At least 1 in 10 children in high-income countries regularly and repeatedly experiences

bullying. While chronic bullying in Sweden and Iceland affects less than 5 per cent of children, Canada has the fifth-highest rate at 15 per cent, well above the average of 11 per cent. Many countries have brought bullying rates down, while bullying has increased in others and remained fairly stable in Canada over the past decade.

Together, rates of child homicide and bullying are at alarming levels in Canada, particularly in comparison to the majority of high-income countries. Canada will never be a safe, peaceful

and just nation if it continues to sustain violence against its most vulnerable. The differences in levels of violence between societies underline the fact that violence is a learned, socially condoned behaviour – not a normal part of childhood. Reducing the maltreatment of children, supporting more effective approaches informed by young people to reduce bullying in all forms, and freeing children from the impacts of racialized violence and poverty are critical to reducing the violence burden in young lives.

Many countries have brought bullying rates down, while bullying has increased in others and remained fairly stable in Canada over the past decade.

Figure 28: Children aged 11 to 15 who had experienced bullying at least twice in the past month

NOTE: Chronic bullying refers to when children experience bullying 2 or more times in the past month.

Canada will never be a safe, peaceful and just nation if it continues to sustain violence against its most vulnerable. The differences in levels of violence between societies underline the fact that violence is a learned, socially condoned behaviour – not a normal part of childhood.

Data Pothole

Target 16.2 aims to end all forms of violence against children. One of its three indicators is the proportion of children aged 1-17 who experienced any physical punishment and/or psychological aggression by caregivers in the past month. While low- and middle-income countries increasingly participate in household surveys that include questions about these prevalent forms of violence, Canada fails to do so. The National Longitudinal Study of Children and Youth included a single question about the frequency with which caregivers used physical punishment, but this survey was discontinued after its eighth cycle was conducted in 2008-2009. At that time, approximately 1 in 4 parents of 2- to 9-year-olds reported having physically punished their children. The Canadian Incidence Study of Reported Child Abuse and Neglect also was discontinued after its third cycle was completed in 2008. Data from each of its three cycles indicated that approximately three out of four substantiated incidents of physical maltreatment occurred in the context of punishment. Only ongoing and consistent tracking of the use of physical punishment by parents and caregivers can provide a useful picture of the prevalence of this form of violence against Canada's children.

Data Pothole

Goal 16 calls for indicators of peaceful and just societies for children that measure various forms of violence and exploitation. Canada's data on crime and victimization are expanding to address issues that are challenging to measure, such as trafficking, and the Murdered and Missing Indigenous Women and Girls Inquiry aims to fill data holes for this highly victimized group. The Goal also has indicators that are not sufficiently tracked and would require asking children and youth for their views on aspects of their society, such as whether they feel safe walking alone, if they are satisfied with the public services they experience, if they believe decision-making includes and responds to them, and if they have been discriminated against or harassed. Importantly, there is also an indicator to measure the existence of "independent national human rights institutions in compliance with the Paris Principles." Although most peer nations achieve this indicator, Canada will not until it has a National Commissioner for Children and Youth and all provinces and territories establish Child and Youth Advocates/Representatives with full powers and responsibilities.

How national averages hide the vulnerable: the example of Indigenous children

Values of non-discrimination and inclusion are at the heart of the Sustainable Development Agenda, reflected in its central promise of "Leaving no one behind." National averages, which we use as a starting point for debate about the state of children, often render invisible the most disadvantaged and excluded children. Data to measure the equity gaps of Indigenous children from four geographically diverse countries (Australia, Canada, Mexico and Norway) are partial, and not always culturally appropriate or respectful of Indigenous rights. Some SDG indicators are specific about the state of Indigenous peoples. Some are highly relevant to revealing the circumstances of Indigenous children in high-income countries (e.g., 1.4.1, proportion of population living in households with access to basic services; 9.1.1, proportion of the rural population who live within 2 km of an all-season road). The SDG Agenda calls on all governments to disaggregate data and make all children visible.

Goal 1: End Poverty Indigenous children typically face rates of poverty higher than national averages. In 2010, 38 per cent of Indigenous children (First Nations, Inuit and Métis) in Canada lived in income poverty compared to 17 per cent of non-Indigenous children. Further disaggregation by identity shows that half the children of Status First Nations in Canada lived in poverty. In Mexico, 78.6 per cent of children and adolescents in Indigenous households and 90.8 per cent of those who spoke an Indigenous language were in poverty in 2014. This is compared with 50.7 per cent of non-Indigenous children and adolescents.

Goal 3: Health and Well-being In 2011, 11 per cent of Aboriginal and Torres Strait Islander babies in Australia were born with low birth weight – more than twice the proportion of non-Indigenous babies. Data collected in 2014 showed adolescent birth rates among Sami people in Norway were more than twice the national average. Aboriginal children in Canada experience higher rates of injury, suicide, obesity, infant mortality, and health conditions such as tuberculosis.

Goal 4: Quality Education Despite progress in many countries, closing the education gap between Indigenous and non-Indigenous children remains a challenge. According to a 2015 Australian government report, Aboriginal and Torres children continued to lag behind their non-Indigenous peers in reading and numeracy, with low attendance one of the critical factors behind this achievement gap. Language is a factor in low school attendance, and preschool programs have an important role to play in supporting Indigenous languages. For instance, in 2015, around half of the 1,000 Sami children enrolled in Norwegian preschool were in Sami-language kindergartens. Yet official statistics on the language of children leaving kindergarten do not include the Sami language.

The SDG agenda is a window of opportunity to support dramatic change in the lives of Indigenous children and youth. One way to promote that is to support Indigenous communities in the advancement of comprehensive, culturally relevant data (Young et al., 2015). Efforts in Canada to improve data collection must respect the OCAP® principles of Indigenous Ownership, Control, Access and Possession of data, respecting their particular cultural contexts, their worldviews about child well-being and their rights. Such data and monitoring can support a stronger focus on policy responses for inclusion and equity.

The Australian government's annual report on progress for Indigenous children on selected indicators in health, education, employment and economic opportunities reveals equity gaps. Canada has unique approaches to support Indigenous-led data and information, including federal support for the National Collaborating Centre for Aboriginal Health and the First Nations Information Governance Centres.

Source: Richardson, D., Bruckauf, Z., Toczydlowska, E., & Chzhen, Y. (2017). Comparing Child-focused SDGs in High-income Countries: Indicator development and overview. Innocenti Working Paper 201, UNICEF Office of Research – Innocenti, Florence.

SO CANADA, HOW DO WE MAKE THINGS BETTER?

UNICEF Report Card 14 delivers a child-centred assessment of where high-income nations stand in the journey towards sustainable development.

It reminds us that sustainable development will not come without the well-being of children and youth. There are many positive stories within these indicators and rankings. Canada has achieved declines in the rates of neonatal mortality, teenage births and drunkenness, and child homicide. It has sustained a high-performing, equitable education system and advanced preschool participation. Young people show a high level of environmental awareness. Yet, even where our indicators are improving, some of the “Possibility Gaps” – the distances between Canada’s outcomes and the outcomes achieved by the best performers – are still too large.

We are still far from delivering for Canada’s children the vision held out by the SDGs; that by achieving the Global Goals by 2030, we have the potential to grant every child a fair chance in life, ensuring them health, safety, education and empowerment.

Income inequality is wide, affecting children broadly and leaving farther behind those with the lowest family incomes; the income advantage gap is stretching the capacity of Canada’s public education system to even out the impacts of inequality. Too many young people are excluded from education and employment. Unhealthy weight, poor mental health and bullying persist with little progress. The rise in urban air pollution is also a concern for child health and development. Never before have we recorded erosion in so many indicators of child and youth well-being in Canada – the general trend in the past has been to make improvements in most indicators.

National income levels do not explain the differences between Canada and the top performing countries; nor do rates of immigration, the unique inequalities experienced by Indigenous children, or problems with data. Countries that rank high on income equality tend to also score well on limiting poverty, ensuring healthy lives and reducing violence. This demonstrates that government policies and priorities are critical if children are to make sustained progress.

Only concerted action will close the distances to the best outcomes for children and youth achieved by top-performing countries. National shortcomings in producing data should not be an excuse for failing to act on the data we have. Perfect data is an unattainable ideal and should not be the enemy of good data. On the other hand, good should not be the enemy of great when it comes to the outcomes we should expect for Canada’s children and youth. We can allow ourselves to be stalled by debates over statistics and be content with mediocrity, or we can get on with filling data gaps and closing the “Possibility Gaps” revealed by the league tables. We need to work in new and different ways to improve child well-being so that we build the momentum needed in Canada and see measurable change the next time we take the temperature of the state of our children and youth.

Calling on Canada to Act

Based on the evidence collated in this Report Card, we urge Canadians to take action in five ways.

1. Make data-driven decisions to prioritize efforts to improve child well-being.

The league table shows which countries come closest to achieving child-focused targets for each SDG. To free ourselves from the middle, we need to focus on the indicators where Canada lags farthest behind our peers (the “Possibility Gaps”) and those that are eroding or stuck (the “Progress Gaps”). Communities, civil-society, governments and all levels and funders—be they community, family or corporate foundations—should focus their energy on the gaps we can address that will have the greatest impact on well-being.

2. Collect disaggregated data.

National averages often conceal extreme inequalities within any given indicator. Some children are so excluded they are missing from available data. Data collection efforts should aim to be as inclusive as possible, but also sensitive to children with diverse cultural and gender identities and respectful of their rights. Every agency and organization that collects population data should also measure the gaps, using UNICEF's bottom-end inequality calculation and other parity measures where data permits.

3. Develop an SDG Strategy.

The Government of Canada has committed to meeting the Sustainable Development Goals in Canada and therefore must lead the development of a pan-Canadian strategy for SDG implementation that incorporates key measures for children's rights and well-being. This should involve participatory and inclusive consultations with key stakeholders, including: provinces and territories; First Nations, Métis and Inuit; civil society and the academic and research community; the private sector; and children and young people.

4. Dream for our children.

Start a conversation in your family, community and workplace about what we want for our children. What kind of values do we want to influence our actions? Canada needs to consider how overall income inequality, family stress and competition are affecting the well-being of children and youth across income, gender and other social divides. We need to dream big for our children and take action to keep those dreams alive.

5. Listen to children and young people.

Children and young people are experts in their own lives. They know what fuels their dreams and brings them life satisfaction, and they have ideas that can contribute to new solutions for the biggest challenges to well-being. Whether you are a parent, a community or business leader or in government, you can create opportunities to engage with children and young people, listen to their experiences and ideas and work with them to develop new solutions.

Invest in the Early Years

Different levels of government need to cooperate to put in place universal, progressive policies and programs for the early years combined with a capacity to identify those falling behind. This will help us close the "Equality Gaps" among Canada's children and youth and boost overall outcomes.

The Big-City Challenge

What if Canada's three largest cities – Toronto, Montreal and Vancouver – agreed on a "Possibility Gap" they could pursue in collaboration, such as unhealthy weight? With 30 per cent of Canada's children in these cities, we could make measurable progress up the league tables of child and youth well-being, change the lives of millions of children and provide other communities with possible solutions to be adapted and adopted.

The "Beat the Index" Challenge

What if every community in Canada chose lagging indicators and made a plan to "beat" the national averages? We would ignite a virtuous cycle of raising community outcomes as well as the national averages, and make measurable progress up the league tables of child and youth well-being.



One Challenge. One Canada. One Childhood.

ONE YOUTH

UNICEF Canada is taking action to help improve the well-being of children and youth in Canada through its new initiative, One Youth.

One Youth is a movement of children, young people and adults who want the best possible opportunities for every young person in Canada. One Youth will elevate the well-being of children and youth to a higher national priority.

We have a bold goal: to make Canada #1 on the UNICEF Index of Child Well-being by 2030.

How are we going to do this? By using One Youth's three pillars:

1. Measure

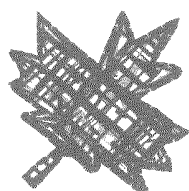
- Understand what's important to children and young people
- Create the Canadian Index of Child and Youth Well-being to develop a way to measure child and youth well-being and track how well our children and youth are doing
- Focus where Canadian children are falling behind other countries and why

2. Design










- Launch the One Youth Design Studio to create a safe space for children, youth and adults to come together, take chances and come up with ideas, test their ideas and try to solve these issues
- Develop a Designing with Kids Toolkit so that communities across the country can work together with children and young people to find new local solutions


3. Influence

- Start a dialogue with Canadians about child well-being to bust myths and make it a priority issue for Canadians
- Use our collective voice to influence every Canadian to contribute to positive change and make Canada a better place for children and youth
- Rally Canadians to speak up and get friends, community and decision-makers to address the issues and improve the lives of children and young people across the country



APPENDIX A: CONNECTING THE SDGS TO CHILD WELL-BEING INDICATORS

Goal	Target (by 2030 unless specified)	Report Card 14 indicator
1 End poverty in all its forms everywhere 	1.2 Reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions	Relative child poverty (60% of the median household income)
	1.3 Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable	Proportion of children living in multidimensional poverty
		Reduction in the rate of child poverty due to social transfers
2 End hunger, achieve food security and improved nutrition 	2.1 End hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round	Children under 15 living with a respondent who is food insecure (%)
	2.2 End all forms of malnutrition	Obesity rates among adolescents aged 11-15
3 Ensure healthy lives and promote well-being 	3.2 End preventable deaths of newborns and children under 5 years of age	Neonatal mortality rate
	3.4 Promote mental health and well-being	Suicides of adolescents aged 15-19 per 100,000 population
	3.5 Strengthen the prevention and treatment of substance abuse, including harmful use of alcohol	11-15-year-olds reporting 2 or more psychological symptoms more than once a week (%)
	3.7 Ensure universal access to sexual and reproductive health-care services	Children aged 11-15 who reported having been drunk in the previous month (%)
		Number of births per 1,000 females aged 15-19
4 Ensure inclusive and equitable quality education for all 	4.1 Ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes	15-year-old students achieving baseline proficiency across reading, mathematics and science (%)
	4.2 Ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education	Participation rate in organized learning (one year before official primary entry age)
5 Achieve gender equality and empower all girls 	5.1 End all forms of discrimination against all women and girls everywhere	Share of adult respondents agreeing "university education is more important for a boy than for a girl"
	5.2 Eliminate all forms of violence against all women and girls in the public and private spheres	Gender difference in girls' and boys' share of daily participation in housework by age
8 Promote full and productive employment and decent work for all 	8.5 Achieve full and productive employment and decent work for all women and men	Women aged 18-29 who reported having experienced sexual violence before age 15 (%)
	8.6 By 2020, substantially reduce the proportion of youth not in employment, education or training	Children living in jobless households (%)
10 Reduce inequality within and among countries 	10.1 Progressively achieve and sustain income growth of the bottom 40% of the population	Youth aged 15-19 not in education, employment or training (%)
	10.2 Empower and promote the social, economic and political inclusion of all, irrespective of economic or other status	Palma Ratio: ratio of income share held by top 10% of households with children to bottom 40%
	10.3 Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and action in this regard	Impact of socio-economic status on students' performance across 3 subjects
11 Make cities inclusive, safe, resilient and sustainable 	11.6 Reduce the adverse per-capita environmental impact of cities, including by paying special attention to air quality	Gap between household income of child at 50th percentile (median) and child at 10th percentile, reported as % of median
12 Ensure sustainable production and consumption patterns 	12.8 Ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature	Annual average PM2.5 concentrations in urban areas, weighted by proportion of child population (0-19) living in urban areas
16 Promote peaceful and inclusive societies for sustainable development 	16.1 Significantly reduce all forms of violence and related death rates everywhere	15-year-old students familiar with 5 or more environmental issues (%)
	16.2 End abuse, exploitation, trafficking and all forms of violence against and torture of children	Deaths of children aged 0-19 by intentional assault per 100,000
		Children aged 11 to 15 who have experienced bullying at least twice a month in the past month (%)
		Women aged 18-29 who reported having experienced physical violence before age 15 (%)

 Missing Canadian data

APPENDIX B: AN ALTERNATIVE POSSIBILITY GAP CALCULATION

Relationship to SDG global indicators
Official SDG indicator which uses 60% of the median for cross-country comparability
Based on UNICEF MODA methodology, which uses 7 child-specific dimensions of poverty for cross-country comparability
Adapts the official SDG indicator for better country coverage
Official SDG measure of food insecurity applied to households with children under 15
Obesity is a form of malnutrition, and is highly relevant for high-income countries. Differs from the official SDG indicator
Official SDG indicator
Official SDG indicator applied to relevant age group
Indicator chosen for its relevance for high-income countries and links to suicidal behaviour. No matching global indicator
Drunkenness is a proxy of harmful use of alcohol among children and young people. Differs from the official SDG indicator
Official SDG indicator applied to the relevant adolescent population
Official SDG indicator covering young people at the end of secondary education, adapted to reduce subject-specific bias
Official SDG indicator
Measure of values and attitudes towards equal gender opportunities for children. No matching global indicator
Proxy of intergenerational transfer of norms as regards gender roles. No matching global indicator
Differs from the global indicator in age group and recall period due to limited availability of cross-national data
New indicator showing the proportion of children impacted by unemployment/inactivity of household members
Official SDG indicator, but with more child-specific age coverage (15-19 rather than 15-24)
Not an official SDG indicator, but a standard indicator of inequality, adapted to reflect children's experience
Not an official SDG indicator, but an equal-opportunity measure regularly reported by PISA
Not an official SDG indicator, but consistently used by UNICEF <i>Report Cards</i> to measure how far behind the poorest children are being allowed to fall from 'average' standards in society
Official SDG indicator but weighted to reflect the proportion of children living in cities
Not an official indicator but reflects the SDG focus on education for sustainable development (including climate-change education)
Official SDG indicator adapted for children aged 0-19
Bullying as a form of physical and psychological violence corresponds to the official indicator but focuses on children
Differs from the global indicator in age group and recall period due to limited availability in cross-national data

Rank	Possibility Gaps (z scores)
1	Unhealthy Weight
2	Breastfeeding
3	Social Transfers for Children
4	Teen Suicide
5	Teen Drunkenness
6	Bullying
7	Bottom-end Income Inequality
8	Child Income Poverty
9	Neonatal Mortality
10	Income Advantage Gap
11	Teen Mental Health
12	Children's Food Security
13	Awareness of Environmental Problems
14	Excluded Youth (NEET)
15	Air Pollution in Cities
16	Overall Income Inequality
17	Child Homicide
18	Teen Births
19	Preschool Participation
20	Children in Jobless Households
21	Basic Learning Proficiency

NOTE: The "Possibility Gap" is a theoretical measure of the difference between Canada and the best performing country in each indicator (the relative positions are based on z-scores and distance from the mean). The larger the gap, the more room for improvement.

APPENDIX C: SUMMARY OF CANADIAN SDG INDICATORS OF CHILD AND YOUTH WELL-BEING

Indicator	Rank	Value	Top	Average	Change
Basic Learning Proficiency	4	80.8%	83.1%	68.6%	+2.0
Parental Employment	4	4.2%	2.1%	9%	0
Environmental Awareness	6	71%	82%	62.1%	N/A
Income Advantage Gap	11	32.9%	20.6%	38.1%	+0.5
Teen Mental Health	14	22%	14.2%	23.1%	+0.2
Teen Drunkenness	17	7.2%	1.7%	6.9%	+4.1
Breastfeeding	18	30%	71%	45.5%	N/A
Preschool Participation	19	96.5%	99.9%	95.3%	N/A
Air Pollution in Cities	19	9.7 PM 2.5	4.8 PM 2.5	10.7 PM 2.5	+0.5
Excluded Youth (NEET)	20	7.1%	2%	7.1%	+0.2
Bottom-end Income Inequality	23	51.6%	34.2%	51.2%	+0.2
Teen Births	23	9.5/1000	1.6/1000	13.3/1000	-4.7
Child Income Poverty	24	22.2%	9.2%	22.4%	-1.8
Overall Income Inequality	24	1.12	0.70	1.17	-0.03
Children's Food Security	24	11.9%	1.4%	12.7%	N/A
Bullying	27	15%	4.5%	10.1%	+0.5
Social Transfers	29	21%	66%	27.5%	0
Unhealthy Weight	29	25%	8.3%	15.2%	+3.9
Neonatal Mortality	29	3.6/1000	0.9/1000	2.8/1000	-0.5
Teen Suicide	31	8.5/100k	1.7/100k	6.1/100k	-0.2
Child Homicide	37	0.9/100k	0	0.65/100k	-0.17

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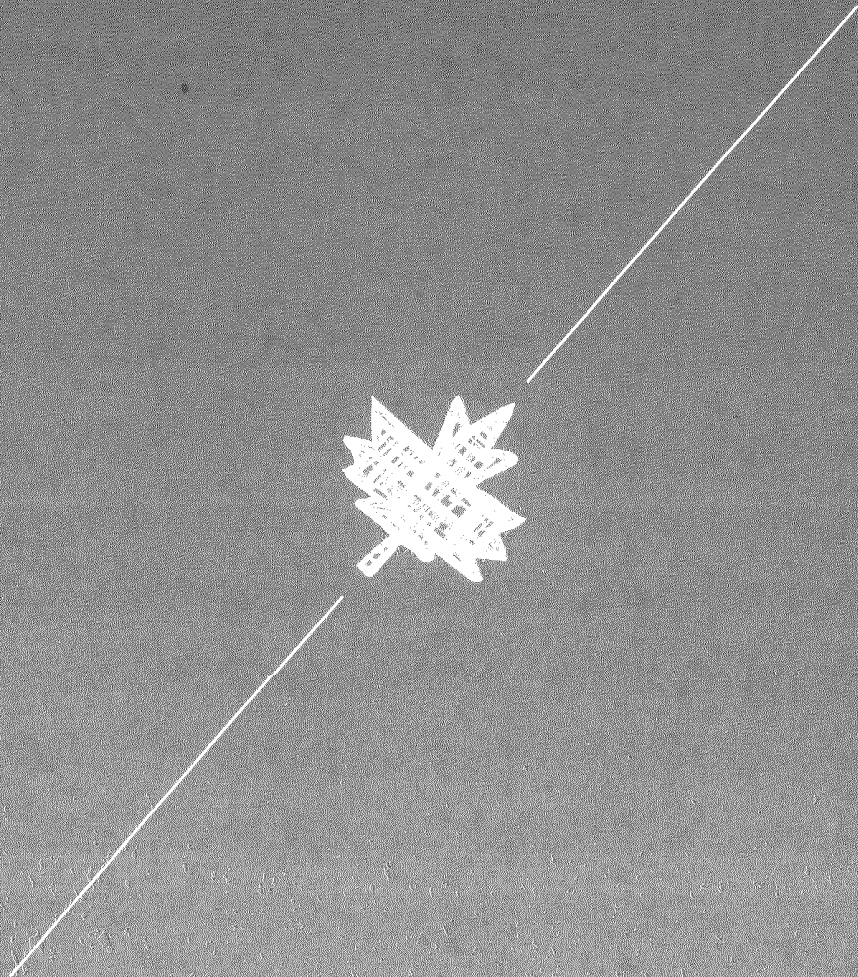
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5. Waterloo Region: A Demographic Profile

Appendix A.

Children and Youth in Waterloo Region: A Demographic Profile



**Children and Youth
Planning Table**
of Waterloo Region

Children and Youth in Waterloo Region: A Demographic Profile

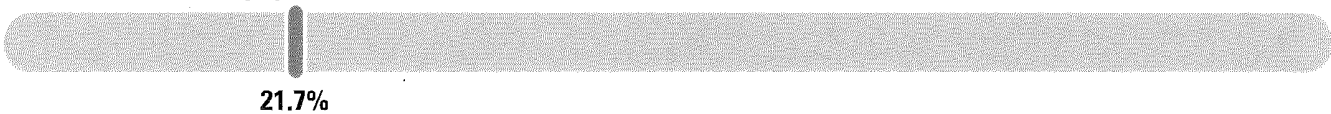
This profile provides a description of the demographics of children and youth, and their families, in Waterloo Region. This profile is a snapshot in time. All data in this report is related to the population in private households from the 2016 Canadian Census (unless otherwise noted). For the

purpose of this report, children and youth refers to anyone from birth to 17 years of age at the time of the 2016 Census. Please refer to Region of Waterloo census bulletins for more details about the census or information on Waterloo Region's overall population.

Population of Children and Youth in Waterloo Region

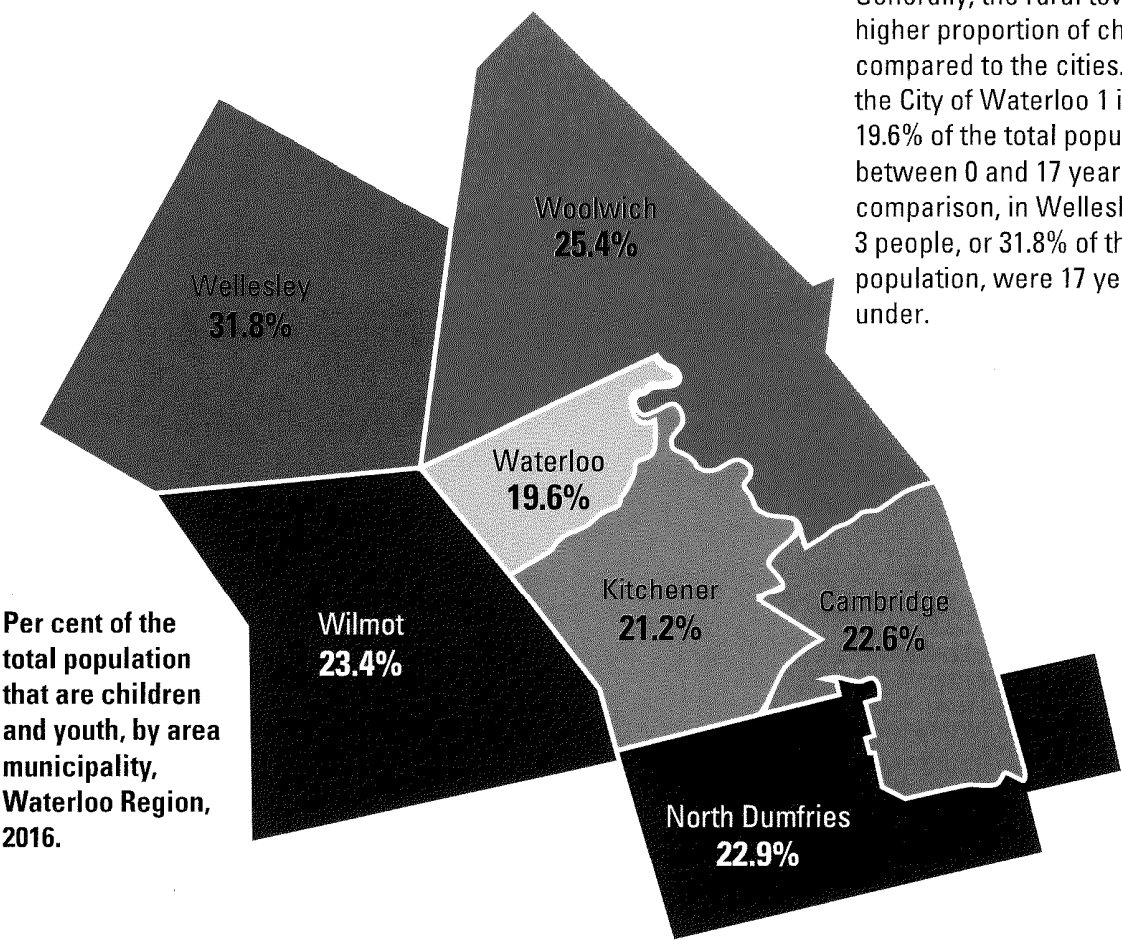
Although the population of Waterloo Region is aging over time, in 2016, children and youth made up 21.7% (114,645 children and youth) of the total population. In contrast, adults 65 years and older made up 14.4% of the population.

Per cent of the total population that are children and youth in Waterloo Region, 2016.



Children and Youth in Area Municipalities

Generally, the rural townships have a higher proportion of children and youth compared to the cities. For example, in the City of Waterloo 1 in 5 people, or 19.6% of the total population, were between 0 and 17 years of age. By comparison, in Wellesley Township 1 in 3 people, or 31.8% of the total population, were 17 years of age or under.

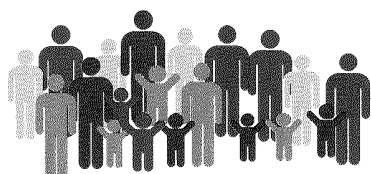


Per cent of the total population that are children and youth, by area municipality, Waterloo Region, 2016.

2 Children and Youth in Waterloo Region: A Demographic Profile

Population Growth

From 2011 to 2016, the total population for Waterloo Region grew by 5.5%. Over the same time period, the population of children and youth increased by 1,190 children and youth for a growth rate of 1.1%.



2011



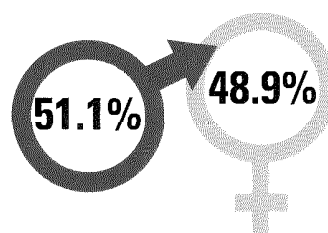
2016

Number of children and youth, by sex and area municipality, Waterloo Region, 2016

Municipality	Male	Female
Kitchener	24,810	23,870
Cambridge	14,640	14,250
Waterloo	10,405	9,815
Woolwich	3,215	3,005
Wilmot	2,420	2,325
Wellesley	1,870	1,710
North Dumfries	1,185	1,130
Waterloo Region	58,545	56,100

Population by Sex

In Waterloo Region, 49.4% of the total population were male and 50.6% of the population were female. For the child and youth population, 51.1% were male and 48.9% were female. While these numbers are relatively close, the overall population of Waterloo Region was represented by more females than males; with the child and youth population the opposite was true - there were more males than females.

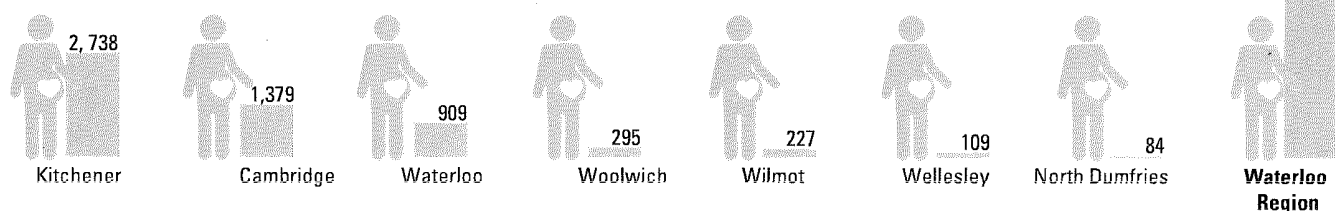


In Waterloo Region, 51.1% of the population of children and youth were male and 48.9% of the population were female.

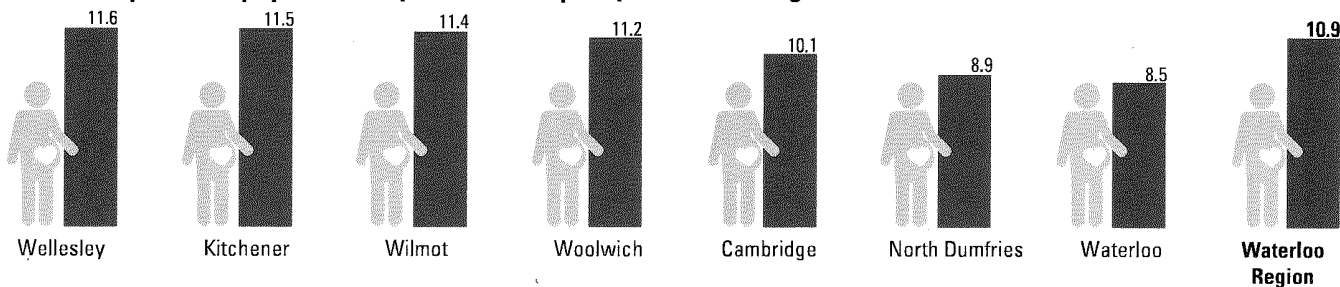
Birth Rates

In 2016, there were 5,972 live births in Waterloo Region, for a birth rate of 10.9 per 1,000 population. There was a slightly higher birth rate in Waterloo Region than Ontario overall. Across Waterloo Region area municipalities, birth rates ranged from 8.5 per 1,000 population in the City of Waterloo to 11.6 per 1,000 population in the Township of Wellesley.ⁱ

Number of live births, by area municipality, Waterloo Region, 2016



Birth rate per 1,000 population, by area municipality, Waterloo Region, 2016



First Nations, Métis, and Inuit Children and Youth in Waterloo Region

We acknowledge that the local data on First Nations, Métis, and Inuit populations in Waterloo Region is limited and the numbers may be higher than reported in the census. Overall, First Nations, Métis and Inuit peoples made up 1.7% of the total population of

Definition:

'Aboriginal Peoples', a term frequently used by government agencies that collectively refers to "Indians, Inuit and Métis." However, local communities in Waterloo Region typically prefer the term "First Nations, Métis and Inuit Peoples" or "First Peoples".ⁱⁱ

Immigrant Population

In 2016, 6.8% of children and youth in Waterloo Region were immigrants. The percentage of children and youth who were immigrants ranged from 9.1% in the City of Waterloo, to 0.9% in North Dumfries. Generally, there was a higher percentage of children and youth that were immigrants in the cities than the rural townships of Waterloo Region.

Per cent of immigrant children and youth, by area municipality, Waterloo Region, 2016

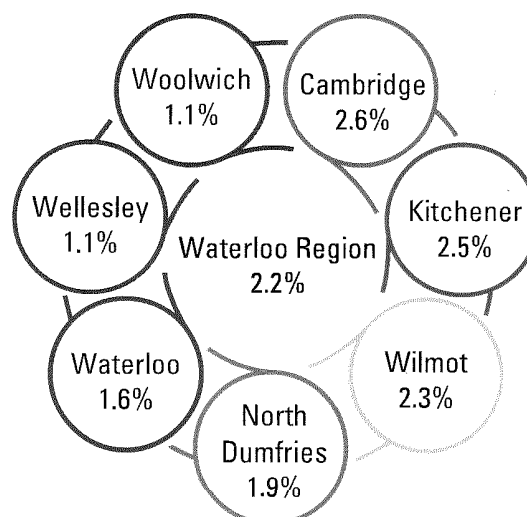
Municipality	Number	Per cent
Waterloo	1,840	9.1%
Kitchener	4,355	8.9%
Cambridge	1,235	4.3%
Woolwich	155	2.5%
Wellesley	65	1.8%
Wilmot	65	1.4%
North Dumfries	20	0.9%
Waterloo Region	7,740	6.8%

Definition:

'Immigrant' refers to a person who is, or has ever been a landed immigrant or permanent resident, and has been granted the right to live in Canada permanently by immigration authorities.^{iv}

Waterloo Region, while First Nations, Métis and Inuit children and youth made up 2.2% of the population aged 0 to 17 years old.ⁱⁱ Generally, the urban centres had a higher proportion of First Nations, Métis and Inuit children and youth compared to the rural townships.

Per cent of children and youth that identify as First Nations, Métis and Inuit, by area municipality, Waterloo Region, 2016



Top 10 countries of birth for immigrant children and youth, Waterloo Region, 2016

-  1. United States of America
-  2. India
-  3. Syria
-  4. Pakistan
-  5. China
-  6. Iraq
-  7. United Kingdom
-  8. Romania
-  9. Philippines
-  10. Egypt

4 Children and Youth in Waterloo Region: A Demographic Profile

Visible Minority

Almost 1 in 4, 24.0%, of children and youth in Waterloo Region were identified as a visible minority. This amount is higher than the proportion of the total Waterloo Region population identified as a visible minority (19.0%).^v

Definition:

'Visible minority' refers to whether a person identifies themselves as part of a visible minority group, as defined by the Employment Equity Act. This information is used by governments, businesses, community groups, researchers and other organizations to promote equal opportunity for everyone.^{vi}

Per cent of children and youth who are visible minorities, by area municipality, Waterloo Region, 2016

Municipality	Number	Per cent
Kitchener	14,730	30.3%
Waterloo	5,875	29.1%
Cambridge	5,990	20.7%
Woolwich	460	7.4%
Wilmot	255	5.4%
North Dumfries	115	5.0%
Wellesley	140	3.9%
Waterloo Region	27,560	24.0%

Language

In 2016, 2.5% of children and youth in Waterloo Region had no knowledge of either English or French, Canada's two official languages. The top three languages spoken by children and youth with no knowledge of official languages were German, Arabic, and Mandarin. Both Vietnamese and Punjabi (Panjabi) rank equally as the 10th language most often spoken at home.

Top 10 languages spoken most often at home for children and youth age 0-14 in Waterloo Region who have no knowledge of English or French

1. German
2. Arabic
3. Mandarin
4. Persian (Farsi)
5. Serbian
6. Spanish
7. Gujarati
8. Romanian
9. Urdu
10. Vietnamese
10. Punjabi (Panjabi)



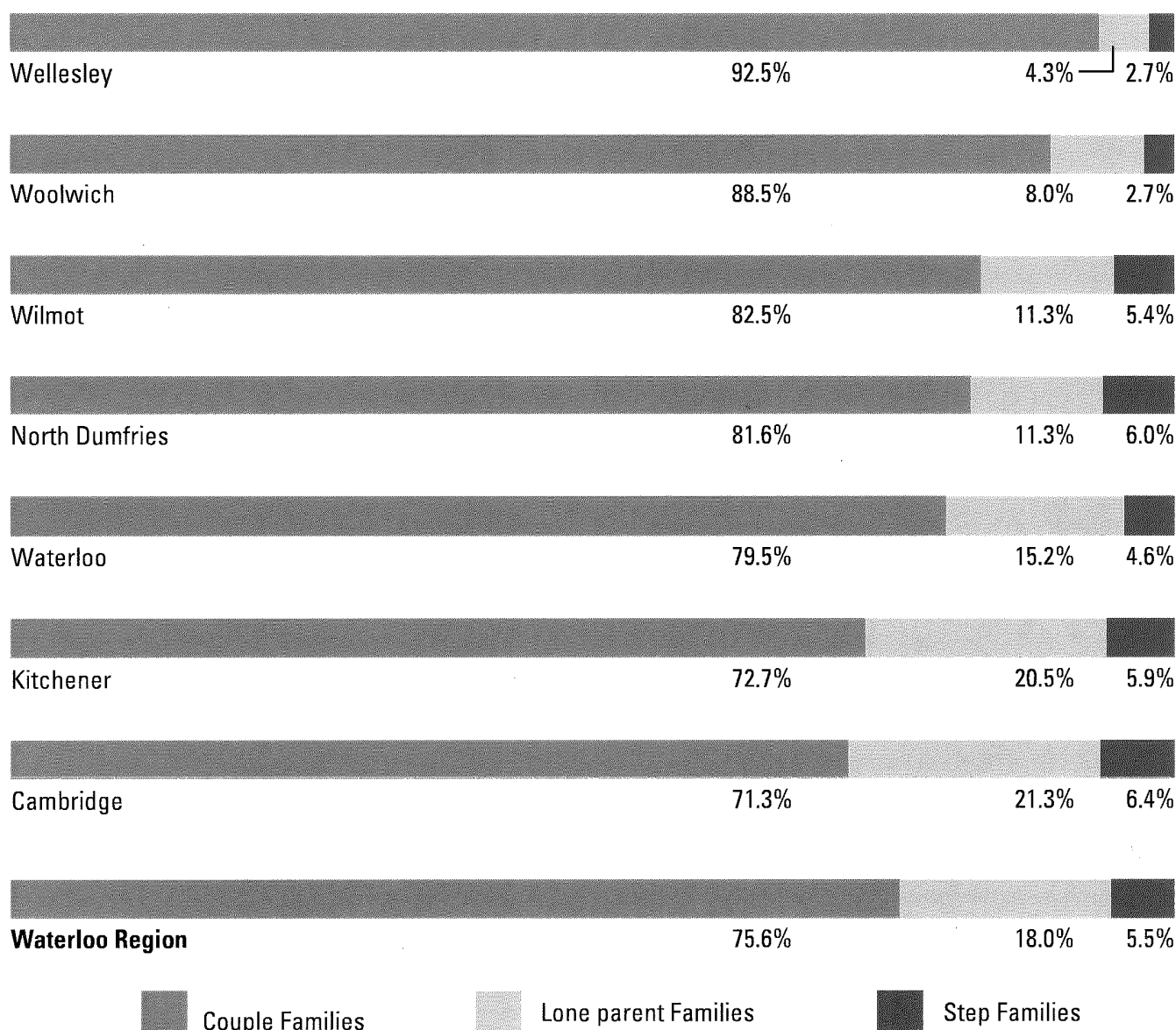
Family Composition

About 3 in 4 children and youth (75.6%) in Waterloo Region lived with two biological or adopted parents. Approximately 18.0% of children and youth lived in lone parent families, and 5.5% lived in step families.

Definition:

'Family' refers to census family: a married, common-law couple, or lone parent of any marital status with, if any, one or more children living with them in the same dwelling.^{vi} Family composition data was not available for children aged 0 to 17 years of age. As such, 0 to 14 years is reported instead.

Per cent of children and youth, by census family type, by area municipality, Waterloo Region, 2016



6 Children and Youth in Waterloo Region: A Demographic Profile

Children and Youth with Low Income

The 2016 census provides income information for families and individuals for the 2015 tax year. In 2015, 1 in 8 children and youth in Waterloo were living in low income. This is equal to 14,484 children and youth from 0 to 17 years of age living in low income in our community.

Per cent of children and youth living in low income (MBM), by area municipality, Waterloo Region, 2015

Municipality	Number	Per cent
Kitchener	7,470	15.3%
Waterloo	2,495	12.3%
Cambridge	3,455	12.0%
Woolwich	495	8.0%
Wellesley	280	7.8%
Wilmot	210	4.4%
North Dumfries	85	3.7%
Waterloo Region	14,485	12.6%

Definition:

Market Basket Measure (MBM) is Canada's Official Poverty Line. The MBM is a measure of low income which is based on the cost of a basket of goods and services that individuals and families require to meet their basic needs and achieve a modest standard of living.

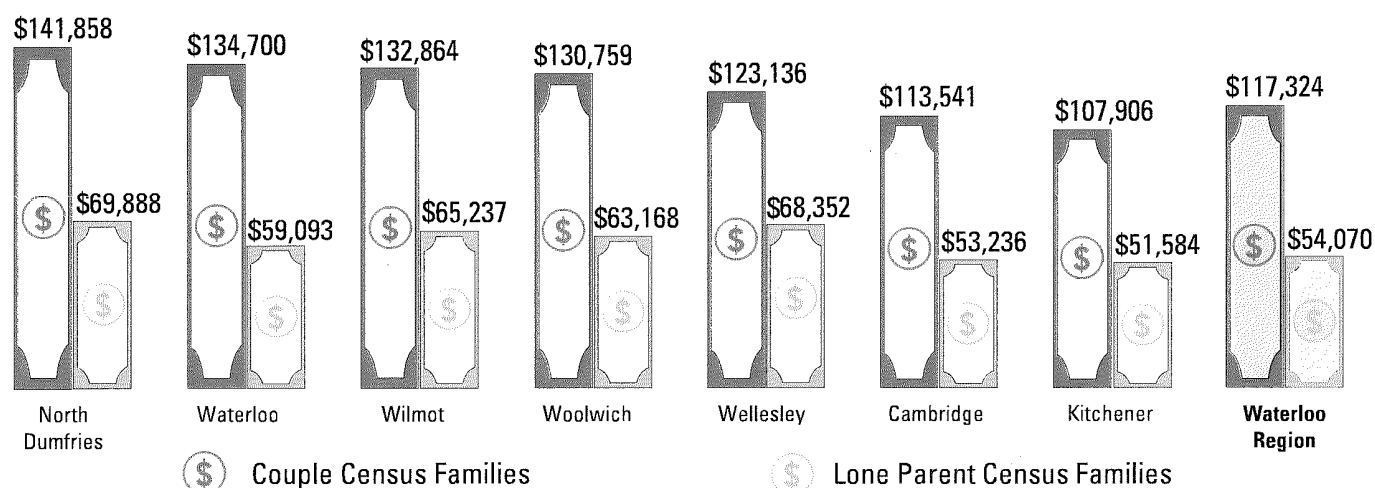
Wherever individuals and families are living across the country, if they cannot afford the cost of this basket of goods and services in their particular community, they will be considered to be living below Canada's Official Poverty Line.^{viii}

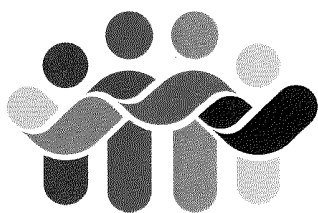
There are two other common measures of low-income status (Low Income Measures and Low Income Cut-Offs), which present slightly different results than the MBM.

Family income

In 2015, the median total income for couple census families with children in Waterloo Region was \$117,324 and was \$54,070 for lone parent census families. Note that the data about median income is for census families with children of all ages. As such, the data also includes adult dependent children over age 17.

Median total income of couple census families with children and lone parent census families with children, by area municipality, Waterloo Region, 2015





Children and Youth Planning Table of Waterloo Region

Notes

ⁱ Region of Waterloo Public Health. "Quick Stats." *Region of Waterloo*. Last modified July 12, 2018. https://www.regionofwaterloo.ca/en/regional-government/resources/Reports-Plans--Data/Public-Health-and-Emergency-Services/QLIVE_BIRTHS.pdf

ⁱⁱ Region of Waterloo Planning, Development, and Legislative Services. "Census Bulletin 2016: Ethnic origins, visible minorities and aboriginal peoples." *Region of Waterloo*. Accessed December, 2018. <https://www.regionofwaterloo.ca/en/regional-government/resources/Census/Census-Bulletin-7-Ethnic-Origins-visible-minorities-ACCESS.pdf>

ⁱⁱⁱ Ibid.

^{iv} Statistics Canada. "Dictionary, Census of Population, 2016 Immigrant Status." *Statistics Canada*. Last modified January 3, 2019. <https://www12.statcan.gc.ca/census-recensement/2016/ref/dict/pop148-eng.cfm>.

^v Region of Waterloo. "Census Bulletin 2016: Ethnic origins, visible minorities and aboriginal peoples."

^{vi} Statistic Canada. "Visible Minority, National Household Survey (NHS) Dictionary." *Statistics Canada*. Last modified January 4, 2016. <https://www12.statcan.gc.ca/nhs-enm/2011/ref/dict/pop127-eng.cfm>.

^{vii} Statistics Canada. "Dictionary, Census of Population, 2016 Census Family." *Statistics Canada*. Last modified January 3, 2019. <https://www12.statcan.gc.ca/census-recensement/2016/ref/dict/fam004-eng.cfm>.

^{viii} Statistics Canada. "Measuring low income and Canada's Official Poverty Line." *Statistics Canada*. Last modified February 1, 2019. <https://www.statcan.gc.ca/eng/consultation/mbm>.

Published January 31, 2019
Learn more about the **Children and Youth Planning Table**
www.childrenandyouthplanningtable.ca

6. WWR Indigenous Community Consultations

Appendix A.

Wellbeing Waterloo Region

Indigenous Community Consultations

Updated - September 13, 2018

Purpose

The purpose of this document is to provide an overview of the issues and calls to action identified through the one-to-one meetings with Indigenous leaders and allies. A scan of research was completed to understand if there were any similar themes or issues identified over the past 5 years. It is noted that the scan of the existing research and reports fully support the themes identified through these insightful meetings.

Overview

Throughout the journey of Wellbeing Waterloo Region there have been many ways we have invited the public to participate in working groups, community forums, consultations etc. We have not been as successful engaging with certain populations in this community and therefore efforts were made to reach out to gain understanding of how to connect and engage with groups and individuals.

Individual and group meetings were held (appendix 1) and existing research was reviewed (Appendix 2) to gather information and discuss the following questions with Indigenous community leaders:

- What actions need to be taken in order to support wellbeing for Indigenous communities?
- What steps and actions does Wellbeing Waterloo Region need to take in order to build a strong and meaningful relationship with Indigenous communities?
- What are the most effective methods and strategies to engage and work for Indigenous communities?
- What barriers does WWR need to remove to enhance Indigenous communities participation with the initiative?

Thank you!

Wellbeing Waterloo Region would like to acknowledge the time and wisdom that Indigenous leaders and allies shared through these one-to-one meetings.

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Key concerns

The following were concerns identified through the key informant interviews as well as through the environmental scan:

Attitudinal and systemic racism

Attitudinal and systemic racism was cited as present in many of the main stream services and systems that could support the Indigenous communities. Gaps in awareness on the part of health care providers of the impact of historical and present day colonization factors experienced by Indigenous people, and how these factors greatly influence their wellbeing was cited by all.

There was strong support to implement cultural safety and competency training for organizations involved in Wellbeing Waterloo Region. This was noted by participants as foundational to develop future relationships. Education about the history, traditions, values and beliefs of Canada's Indigenous Peoples is an integral component in understanding the contexts which shape how Indigenous health and wellness is defined and appreciated. It was also felt by implementing this training that this would be in accordance with the Truth & Reconciliation Commission of Canada's Calls to Action (2015) which many felt had not been considered or implemented by many mainstream service providers.

It was also stated that the training needs to be led and/or developed in partnership with groups that have experienced exclusion. Some felt that WWR should not expect to be educated by Indigenous communities or for free. Others felt that the training should only be delivered by Indigenous communities so the stories could be shared. Although there was not consensus on who should deliver the training there was consensus that the training needs to be resourced and happen for WWR. This training needs to be separate yet

connected to the diversity and inclusion training.

Gaps in training and opportunities for service providers

There is lack of training and also lack of opportunities for service providers to understand and take the time to understand and consider all aspects of Indigenous life, including family and personal histories which are so important to wholistic health care for Indigenous culture. Also there is not a thorough understanding and knowledge of service providers about the historical and contemporary forms of colonization and the intergenerational impacts it has had on Indigenous Peoples' social, cultural, political, economic, and spiritual wellbeing. Indigenous health cannot be understood in isolation of colonial relations that continue to shape access to health care, health care experiences and health outcomes.

Token versus meaningful engagement

People are tired of being subjects of research and consultation without seeing much in the way of tangible results and progress specific to Indigenous communities. The intention and outcome feels "token" or a check box that main stream organizations need to check off and not worth the time it takes away from their current services.

Lack of resources and time

Indigenous organizations are under resourced and therefore do not have the time to provide input and gather input from their communities. Also there is skepticism that the input is even heard or counted as there is no follow up with reports or actions.

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Mainstream organizations talk to one or two groups only

There are many Indigenous communities living throughout this region and there is not one organization that represents all the indigenous communities. Typically main stream organizations and government go to one or two organizations to gather input. This is not representative of the Indigenous communities in the region. Also not everyone is affiliated with an organization and therefore people who live in this community are missed. And when there is consultation with the small number of groups there is little to no accountability back to the community that was consulted with on the outcomes.

Lack of Indigenous representation and decision making

Indigenous service providers and residents are excluded from planning bodies for a multitude of reasons and therefore their perspectives are not integrated within system planning, service delivery or policies or measurement.

Lack of ongoing funding and reporting burden

There are major barriers in accessing culturally secure and ongoing funding for Indigenous peoples living in Waterloo Region. And when there is funding available service providers are competing against each other for available funding, creating mistrust and competition between agencies. Funding is also often short term and sparse and therefore needs are not met. There are also many administration requirements for reporting that are a heavy burden on small organizations.

Key Issues

Lack of data on the numbers of the indigenous community

Historically, Indigenous Peoples don't often fill out Census Data Forms as they feel it doesn't apply to them, and therefore the numbers reported on the census were felt to be inaccurate. Participants reported that the population in our Region is much higher than documented – closer to 40,000. This has been supported in the Our Health Counts study in Toronto, Hamilton and London which have proven that the percentage of Indigenous Peoples who actually live in an area is 2 to 3 times that measured through the Census. Also surveys and other mainstream data collection methods are seen as being “colonial” and exclusionary of Indigenous culture.

Lack of culturally appropriate primary and mental healthcare

Significant gaps in primary and mental health/addictions services that promote and respect Indigenous methods of healing, including wholistic care, Elders and spiritual ceremonies were noted by many of the participants. With regards to programs for age specific groups – services directed at youth and seniors were noted as extremely lacking. Many members stated that over the last ten years, they have articulated numerous barriers to accessing primary health and mental health and addictions treatments in a variety of consultations and proposals to different funders but with no outcome.

Participants also noted that mainstream services do not always have to provide the actual programs, instead they can provide the space and resources for the Indigenous community to provide the services for themselves.

Call to Action

Suggested actions

The following provides a summary of suggested actions that Wellbeing Waterloo Region and community partners could take in order to address some of the issues identified in the previous section. The suggested actions are in no particular order.

Develop meaningful relationships with Indigenous communities

Develop respectful and meaningful relationships with Indigenous People to foster intercultural understanding and connection that facilitates authentic conversations and input. It was suggested that in the beginning stages of this work that a clear vision and set of guiding principles would provide the foundation to develop positive, life long and meaningful relationships. This action needs to be documented explicitly in the WWR Plan in order to signify a commitment. Commit to developing culturally appropriate ways to gather resident insights so that programs and services are provided in culturally appropriate ways.

Respect for Indigenous diversity

There is diversity amongst Indigenous communities. Therefore the work and process that happens through Wellbeing Waterloo Region needs to recognize and include representation from First Nation, Métis and Inuit peoples.

Explore the possibility of developing a region wide Indigenous Advisory Council

There have been attempts to develop an Indigenous Advisory Council in the past that have not been sustained for a variety of reasons. The majority of participants suggested that the timing and need for the development of an Advisory Council would be better supported now. Therefore a suggested action was to explore the possibility of developing a region wide Indigenous Advisory Council (members represent the diversity of the Indigenous community), that is supported

and resourced to provide advice and input on Wellbeing Waterloo Region as well as services and programs in Waterloo Region. Some had suggested that a current organization help to lead this exploration and some cautioned that this may not be the best approach as it would be difficult to choose one organization that represents the diversity of Indigenous communities in this region. Other suggested that we look to Oxford County and learn from their Advisory Council as it was cited as a promising practice for Waterloo Region.

Recognition for wholistic wellbeing model

Indigenous wellness models are, by nature, wholistic. Creating an understanding of this model with the wellbeing sector is key to delivering culturally appropriate services. The conceptualization of wellbeing considers the balance and maintenance of the physical, emotional, spiritual, and mental aspects of a person. This model promotes an understanding of the interconnectivity of all aspects of one's being, along with the interconnectivity of oneself and one's connection to the community and the natural environment. In a wellness framework, this recognizes that numerous factors affect a person's wellbeing, including access to traditional culture and spiritual practices, connection to land, positive community relations.

Support and participate in Indigenous community gatherings

Coming together to celebrate and build relationships is important to Indigenous communities and therefore attending events and being present is key to relationship building and awareness raising.

Call to Action

Create opportunities to develop cultural competency for Wellbeing Waterloo Region members

Develop and deliver training and opportunities to increase capacity of mainstream wellbeing providers involved with Wellbeing Waterloo Region to ensure culturally safe and appropriate care to Indigenous people. Ensure that training addresses the impact of historical and present day colonization faced by Indigenous people is foundational to reconciliation. Take the time needed and make it specific to Indigenous communities.

Recognize and celebrate Indigenous contributions and leaders

The need to recognize and celebrate Indigenous contributions to Waterloo Region was cited by many participants. For example it was suggested that WWR have an annual ceremony to showcase Indigenous leaders contributions to wellbeing Waterloo Region.

Participation of Indigenous community on Wellbeing Waterloo Region

Provide capacity and opportunities for Indigenous representatives to participate on the working groups and decision making tables of Wellbeing Waterloo Region. Provide resources to support involvement and insight gathering from Indigenous communities so that it does not take away from the service provision which was noted as an issue. Also provide support for an Elder to attend key decision making tables. Also WWR needs to consider hiring Indigenous staff for the backbone support functions.

Support Indigenous Health Services

Address the gaps in primary and mental health/addictions services and respect Indigenous methods of healing, including wholistic care, Elders and spiritual ceremonies were noted by many of the participants. Make
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the funding long term instead of seed or demonstration grants. Make resources and the space available in mainstream organizations for Indigenous service providers to deliver culturally appropriate care.

Public awareness campaigns and events

Support Indigenous awareness campaigns and events using a variety of media channels to create awareness, support equity, reduce isolation, support inclusion and strengthen belonging.

Celebrate diversity and profile Indigenous culture and work

Provide supports/resources and opportunities to celebrate cultural inclusion and indigenous leadership. For example it was suggested that funding and supports be provided to help Indigenous communities promote and implement an annual Pow Wow. Other suggestions were to help communicate local stories, support and exhibit local artists (music and visual arts), host conferences or a speakers series and/or have book clubs that feature Indigenous authors.

Monitor Indigenous wellbeing

Working with the Indigenous community to identify methods to obtain and track Indigenous health in the overall measurement system for Wellbeing Waterloo Region needs to be an action under the measurement and monitoring work of WWR. To date, research involving First Nations, Métis and Inuit peoples in Canada has been primarily carried out by non-Indigenous researchers, and has not necessarily provided tangible benefit to Indigenous peoples or their communities. Where data are collected, First Nations, Métis and Inuit peoples are not always asked to identify their Indigenous status, or not all individuals will self-identify, or are otherwise reluctant to participate in surveys and research due to mistrust. As a result, local data on the First Nations, Métis and Inuit populations in Waterloo Region is limited. The data that do exist provide a preliminary foundation of knowledge of the particular challenges for these communities.

CASE FOR CHANGE

The case for change: Why?

Some people may ask “Why should Wellbeing Waterloo Region make special effort to build relationships with First Nations, Métis and Inuit in Waterloo Region? Why not other specific groups?

In Waterloo Region, First Nations, Inuit and Métis people experience greater barriers to wellness compared to non-Indigenous populations. There are proportionately far more Indigenous people who experience poverty, homelessness, precarious housing, unemployment and barriers to education than non-Indigenous populations.¹

First Nations, Inuit and Métis people have important knowledge and insights to offer about what creates and sustains wellbeing. First Peoples have lived in community and cared for the land in this region for thousands of years.² Despite sustained attempts to extinguish Indigenous cultures and communities, First Peoples have proven to be resilient and are now the fastest growing population compared to non-Indigenous populations in Canada.³

The Constitution Act of 1982, Section 35 recognizes that First Nations, Métis and Inuit have a distinct relationship with the government from non-Indigenous Peoples. They are to have the power of self-determination, and inherent rights to land, language, spirituality, culture, justice, economics, health and more.⁴ All levels of government are bound to uphold these rights through the programs they fund.

The barriers to wellness that Indigenous people face are a direct result of government policies that have deprived them of those things that support their wellness---self determination, language, culture and connection to their traditional lands and resources.⁵ This is precisely the situation that many newcomers and refugees have experienced in their countries of origin and have come to Canada to escape. Over the years, agencies in Waterloo Region have made significant efforts to consult with newcomer and refugee groups and provide them with services more suited to their needs. The Indigenous population has been not given similar attention or service. Sometimes they have been consulted---rarely have they seen any actual benefits to their community from these consultations.

The provincial government, who funds most local social service agencies at least in part, has committed to actions that support reconciliation between urban Indigenous communities, the provincial government and the broader public service through the Urban Indigenous Action Plan.⁶ It is informed by the principles of the United Nations Declaration on the Rights of Indigenous People (UNDRIP) and the Report and Calls to Action of the Truth and Reconciliation Commission

¹ https://www.regionofwaterloo.ca/en/regional-government/resources/Reports-Plans--Data/Public-Health-and-Emergency-Services/FirstNation_Métis_Inuit_PopulationProfile.pdf

² <http://archaeologymuseum.ca/southern-ontario-archaeology/>

³ <https://www.statcan.gc.ca/pub/89-645-x/2010001/growth-pop-croissance-eng.htm>

⁴ https://sencanada.ca/content/sen/committee/421/APPA/Briefs/ConstitutionAct_2017-09-19_e.pdf

⁵ <https://www.canada.ca/en/indigenous-services-canada/news/2018/04/the-lancet-series-canadas-global-leadership-on-health.html>

⁶ <https://www.ontario.ca/page/urban-indigenous-action-plan>

(TRC). As well, all levels of government, including some municipal governments (e.g. Kitchener through the Big City Mayors Caucus and their Pathways to Reconciliation Initiative) have committed to taking concrete steps toward reconciliation, beginning with the action of deliberately building respectful relationships with urban Indigenous communities.

The priorities of Wellbeing Waterloo Region relate to concerns of First Nations, Métis and Inuit people in Waterloo Region:

- **To Support the Growth and Development of Children and Youth.** A larger portion of the First Nations, Métis and Inuit population in Waterloo Region is 19 years and younger (35.6 per cent of the First Nations, and Inuit population compared to 25.1 per cent of the total population of Waterloo Region).⁷ Indigenous children are more likely to experience vulnerabilities in Early Childhood Growth and Development than the non-Indigenous population.⁸
- **To decrease social isolation.** There are some similarities of experience between Indigenous people and newcomers and refugees. For example, their experiences of trauma continue to impact their lives and the lives of their children, they have cultural beliefs and practices that are different from and often rejected by the dominant culture, and they frequently experience a lack of culturally sensitive services. As well, for various reasons such as bias, fear and stigma due to colonization, Indigenous people have not been very visible as a community, despite significant numbers of them in Waterloo Region. (The 2016 census says there are 8,985 in Waterloo Region.⁹ However, due to barriers for this population to participate in the census, it is proposed that this number underestimates the actual population by 2-4 times¹⁰, which would make the population in Waterloo Region between 17, 970 - 35, 940 people or between 3.35% and 6.72% of the population).
- **To End Chronic Homelessness---**In the 2014 Point in Time Count, Region of Waterloo Community Services found 16 per cent of the 261 individuals surveyed for chronic homelessness self-identified as First Nations, Métis or Inuit, a clear over-representation for the size of the population.¹¹

⁷ https://www.regionofwaterloo.ca/en/regional-government/resources/Reports-Plans--Data/Public-Health-and-Emergency-Services/FirstNation_Métis_Inuit_PopulationProfile.pdf

⁸ https://www.publichealthontario.ca/en/.../OHP_infog_FirstFiveYears_2014.pdf

⁹ <http://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CD&Code1=3530&Geo2=PR&Code2=35&Data=Count&SearchText=waterloo&SearchType=Begin&SearchPR=01&B1=All&TABID=1>

¹⁰ Rotondi MA, O'Campo P, O'Brien K, Firestone M, Wolfe SH, Bourgeois C, et al. Our Health Counts Toronto: using respondent-driven sampling to unmask census undercounts of an urban indigenous population in Toronto, Canada. *BMJ Open*. 2017;7(12):e018936. Available from: <http://bmjopen.bmj.com/content/7/12/e018936.long>

¹¹ Region of Waterloo Community Services. 2014. Waterloo Region registry week community debrief. Updated June 2015. 2769607

Appendix 1: Participants of consultations and *future consultations (not completed)

Group	Description of service / program	Contact	Role	Phone	email
Anishnabeg Outreach	Employment Support	Lee Ann Hundt	Former Manager	519-742-0300	apatisiwin@anishnabegoutreach.org
Anishnabeg Outreach	Employment Support Our mandate is to assist individuals with their goals in employment, training and education with a special emphasis on the urban Aboriginal population Website: https://aocan.org/	Stephen Jackson	Executive Director	Phone: (519) 742-0300	Stephen Jackson <stephen@aocan.org>
Blue Sky Singers	Community Group A group of First Nations singers, strong and active in the local Indigenous community. Participate in community events, offering traditional First Nations music.	Heather Majaury	Culture Drum Group		heather.majaury@gmail.com
Conestoga College	Indigenous Student Services Provide traditional counselling, weekly luncheons (Wednesday), social and family events, bursary/ scholarship information, Annual Pow Wow (February), Aboriginal Students Association, Elders-In-Residence Program, and student recruitment Website: https://www.conestogac.on.ca/aboriginal-services/contact.jsp	Christina Restoule	Aboriginal Student Services	519-748-5220 ext. 2470	crestoule@conestogac.on.ca
Good Hearted Women Singers/Researcher	Community group	Kelly Laurila	Song Carrier of Mino Ode Kwewak N'gamawak Drum Circle, Reconciliation Circles	519-893-6333 Tamie 519-716-8993	kellylaurila@bell.net tamiejcoleman@gmail.com

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Grand River Metis Council	Métis Community Education They provide training.	Jennifer Parkinson	President		Jennifer Parkinson, President president@grandrivermetisCouncil.com Carol Levis, Senator senator@grandrivermetisCouncil.com Barbra Lair chair@grandrivermetisCouncil.com redbundle@guelphchc.ca
Guelph Community Health Centre	Wellington Services Offers primary health care	Jennifer Arthur Menominee	Indigenous Healing and Wellness Coordinator	519-803-3117	
Healing of the Seven Generations	Residential Schools/Court Work Survivors (and intergenerational) of the residential school system will be taught using; traditional and non traditional practises to approach their healing such as: talking circles, drum group, cultural workshops, speakers and advocacy. Also offer Court worker services. Website: healingofthesevengenerations.weebly.com	Donna Dubie	Executive Director	519-570-9118	7generations@bellnet.ca
House of Friendship	Outreach Multiple services—outreach, counselling, housing, addictions supports, etc.	*Clarence Cachagee	Intensive Housing Support Worker	519 742-8327 ext 429	clarencecec@houseoffriendship.org
Inuit Specific Community Resource	Inuit specific services	*Tauni Sheldon	Inuit Community Resource	905-805-0021	tsheldon384@gmail.com

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Region of Waterloo	Waterloo Region Museum	Dave Neufeld	Education Coordinator	519-575-4400 ext:3646	dneufeld@regionofwaterloo.ca
	Public Health and Emergency Services	Julie Hill	Social Determinants of Health – Public Health nurse		JuHill@regionofwaterloo.ca
Waterloo Region Catholic School Board	Education Sector Curriculum Leader for First Nations, Métis and Inuit education and Equity	Tammy Webster	Equity and Inclusion Officer		tammy.webster@wcdsb.ca
Waterloo Region District School Board	Curriculum Leader for First Nations, Métis and Inuit education and Equity	Nicole Robinson	Equity & Inclusion Officer – Aboriginal focus	519-570-0003, ext. 4329	nicole_robinson@wrdsb.ca
Waterloo Region Community Legal Services	Process Navigator	Lu Lentz	Indigenous Justice Coordinator	519-743-0254	lentzl@lao.on.ca
Waterloo Regional Police Services	Conducting the I am committed Campaign – to launch on September 24 – Victoria Park Pavilion Police Services	Amanda Trites Cynthia Martin	Chair of the First Nations, Métis and Inuit Diversity Committee with WRPS	(519)650-8500 ext:8786	CYNTHIA.MARTIN@WRPS.ON.CA
Wilfrid Laurier	Indigenous Initiatives/WLU Wilfrid Laurier University is committed to supporting Aboriginal Students (First nations, Status, Non-status, Inuit and Métis) at its Brantford, Kitchener, and Waterloo campuses. Provides culturally based workshops, assists with bursary/scholarship information and an Elder's-in-Residence Program.	Jean Becker Jessica Duke Melissa Ireland	Senior Advisor to the President <i>Manager, Indigenous Student Services Office of Indigenous Initiatives / Student Affairs</i>	226-220-3727	jbecker@wlu.ca Jessica Duke jduke@wlu.ca 519.884.0710 x4190 @WLUIndigenous
	Web: https://students.wlu.ca/student-life/indigenous-initiatives-and-services/staff.html				

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Center for Indigegogy - WLU	https://www.wlu.ca/academics/faculties/faculty-of-social-work/centre-for-indigegogy/index.html	Giselle Dias			indigegogy@wlu.ca Giselle Dias gdias@wlu.ca Program Administrator Centre for Indigegogy. Indigenous Centred Wholistic Development
University of Waterloo	In the <u>Master of Social Work (MSW) Indigenous Field of Study</u> program at Wilfrid Laurier University. Offer numerous trainings in Indigenous centred wholistic development to assist practitioners, teachers, learners and helpers strengthen their good medicine, teaching and learning bundles. facilitate the sharing of Indigenous knowledge and provide culturally relevant information and support services for all members of the University of Waterloo community, including Indigenous and non-Indigenous students, staff, and faculty.	*Lori Campbell, Director, Waterloo Indigenous Student Centre Amanda Trites	https://uwaterloo.ca/stpauls/waterloo-indigenous-student-centre		
Ganawendan	Training				<ganawendan.takecare@gmail.com>
Community member	Community Member				
Community member	Community member				
Community member	Community Member Consultant, Educator, Clinician	Ela Smith	UWaterloo Faculty/consultant/clinician	519-998-3147 (c) 519-998-3147	Ela.j.smith@gmail.com Ela.smith@uwaterloo.ca AngEla Smith ela@whirlingwindconsulting.ca E: samanthac@metisnation.org W: www.metisnation.org
Métis Family Wellbeing Métis Nation of Ontario	Coordinator	Sam Cressman, BCCJ	65 Hanson Ave Kitchener, ON, N2C 2H6	Ph: 519-576-0540 ext 3716	
Waterloo Wellington Local Health	French Language Health Services Coordinator/Indigenous Health and Wellness	France Tolhurst		141 Weber St. S, Waterloo, ON, N2J	E: france.tolhurst@lhins.on.ca

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Integration Network **Lead**
Réseau local
d'intégration des
services de santé
de Waterloo
Wellington

2A9
T: 519-748-2222 ex
3236 1.888.883.331
3 ext: 3236

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Appendix 2: Reports reviewed

1. Indigenous Inter professional Primary Care Teams Application Form, June 2017, Primary Health Care Branch, Ministry of Health and Long-Term Care
2. INDIGNEOUS WELLNESS SERVICESIN WATERLOO WELLINGTON: NEEDS AND VISION. Funding Proposal. June 27, 201. Submitted to:Waterloo Wellington Local Health Integration Network and MOHLTC. Submitted on behalf of: Waterloo Wellington Indigenous communities. Conducted by: Sustainable Societies Consulting Group, LTD. Submitted to: Waterloo Wellington Local Health Integration Network and MOHLTC
3. Relationship with Indigenous Communities Guideline, 2018. Population and Public Health Division, Ministry of Health and Long-Term Care. Effective: January 1, 2018 or upon date of release
4. Downloaded from bmjopen.bmj.com on July 15, 2014 - Published by group.bmj.com
5. Our Health Counts: Urban Aboriginal Health Database Research Project. Community report. First Nations Adults and Children. City of Hamilton (April 2011)
6. Final report: Aboriginal Palliative Care Needs Assessment. Final report April 2014. Waterloo Wellington Local Health Integration Network Expressions of Interest: <i>Aboriginal Palliative Care Needs Analysis</i> One-Time Funding October 2 nd , 2013.
7. Indigenous people in Ontario: Historical overview, treaties and land claims, and engagement going forward. Western MSO Planners Forum, October 2017.
8. Closing Gaps in Population Health Information with Indigenous Peoples in Urban Ontario. OPHA Webinar, April 26 th , 2018. Janet Smylie MD FCFP MPH
9. Population Health Profile on First Nations, Métis and Inuit Peoples in Waterloo Region, Public Health and Emergency Services, Region of Waterloo
10. Our health counts Toronto http://www.welllivinghouse.com/what-we-do/projects/our-health-counts-toronto/
11. Our health Counts London http://soahac.on.ca/our-health-counts/
12. Truth and Reconciliation Commission of Canada http://www.trc.ca/websites/trcinstitution/index.php?p=3
13. Truth and Reconciliation Commission of Canada: Calls to action http://www.trc.ca/websites/trcinstitution/File/2015/Findings/Calls to Action English2.pdf
14. The Journey Together: Ontario's Commitment to Reconciliation with Indigenous People. https://www.ontario.ca/page/journey-together-ontarios-commitment-reconciliation-indigenous-peoples Full plan https://files.ontario.ca/trc_report_web_mar17_en_1.pdf
15. The Urban Indigenous Action Plan https://www.ontario.ca/page/urban-indigenous-action-plan
16. INDIGENOUS ALLYSHIP:AN OVERVIEW Jackson Smith Master's Student, Community Psychology, Cassandra Puckett Master's Student, Social Work: Aboriginal Field of Study, Wendy Simon Master's Student, Social Work: Aboriginal Field of Study
17. http://www.sixnations.ca/LandsResources/HaldProc.htm

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7. Youth Engagement Materials

Appendix A.

**Less Telling,
More Asking:
Meaningful youth
engagement at a
glance**



**Children and Youth
Planning Table**
of Waterloo Region

Introduction

Youth in our region have voiced that they do not feel meaningfully involved in the decisions that impact their lives. Our first shared goal at the Children and Youth Planning Table (CYPT) is for children and youth to feel valued, heard, and included. Our membership recognizes the importance of youth engagement and we have prioritized this as an area for collective attention and growth. This resource has been assembled to further support skill and capacity development as we and other adult allies in the community seek to meaningfully engage with youth. The content within this resource has been informed by: local youth voice; the knowledge of our local child and youth serving organizations; and national and international literature. It includes four components:

1. Youth Engagement and Adult Allyship: What is the Difference?
2. Youth Engagement
3. Adult Allyship
4. Interested in Learning More?



Look for this icon for tips, tricks, and other things to support your practice!

Although there is a youth-focus to this resource, the skills and concepts can be used with all ages. Feel free to use this resource as a learning tool and apply the knowledge and skills gained within the unique settings of your workplace. Throughout this document, the term youth is used as a collective term for young people. Remember that each youth is an individual, and so the information within this resource is meant to be adapted to best fit various settings, situations, and people.

This resource is not meant to be one-size-fits-all, but rather a starting point that can be adapted to fit your context. Be open-minded, have fun in the learning, and get creative!

The Children and Youth Planning Table defines **youth** as any person(s) age 12 to 18ish. Although youth are grouped by age, these individuals come from all walks of life and have diverse abilities, needs, interests, and goals.

Intergenerational partnerships refer to the collaboration between youth and adults, characterized by mutual processes of teaching, learning, and shared decision-making!

Youth Engagement and Adult Allyship: What is the Difference?

Youth engagement and adult allyship go hand-in-hand. As adults, we often focus on youth engagement. However, when we do this we only consider the partnership as one-way (adults to youth), rather than understanding the dynamic relationship and the individual responsibilities in that relationship.

When we refer to **youth engagement**, we mean the meaningful participation and ongoing involvement of young people in planning and decision-making at all levels that includes opportunities for growth and leadershipⁱⁱⁱ. At the CYPT, we think of youth engagement as the **what**—what you do in practice to ensure all youth in our community are involved and meaningfully participating.

Adult allyship asks adults to be accountable in our behaviour in intergenerational partnerships. As allies to youth, we need to practice reflexivity—regularly looking within ourselves to understand what factors

influence our behaviour and how this behaviour has an effect on those around us^{iv}. At the CYPT, we like to think of this as the **how**—how you enter into partnerships and understanding your role as an adult-partner^v.

"In practice, a sole focus on youth is misplaced. Youth–adult partnerships demand **consideration of adult development**."ⁱⁱ

🌱 Remember, "ally" is a title you are given by others, not one you give yourself.

Both meaningful youth engagement and adult allyship must be built on the foundation of **why** we do this work. For the CYPT, it is our underlying commitment to ensuring children and youth in our region feel valued, heard, and included.

Youth Engagement

Youth engagement is achieved when youth are meaningfully participating and continuously involved in planning and decision-making at any and all levels (e.g. program, organizational, system). Within this process, youth have opportunities for ongoing learning, skill development, and leadership opportunities.

So, why is youth engagement important? To begin, the youth brain is in an amazing stage of development where it has a heightened potential to change through experience^{vi}. At the same time, by age 15, a person's reasoning ability, or logical thinking and problem-solving skills, is fully developed^{vii}. This means that youth have insurmountable potential to contribute, which can be realized through opportunities for meaningful participation. In recognizing youth's ability to be agents of change in the community, there is a valuable opportunity to connect youth with those who hold decision making power. When we do this, communities can better leverage innovative solutions^{viii}.

What happens when youth are meaningfully engaged?

- Youth and adults develop new skills and build their capacities as agents for change.
- New and meaningful ideas are generated^{ix}.
- Organizations and programs are more responsive to youth needs and wants^x.
- Networks are strengthened between youth and adults, and an increased sense of belonging for all age in the community is fostered^{xi}.
- Communities pave the way for innovative solutions to societal challenges.^{xii}

Youth have something to contribute now, and this means changing the mindset from "How can adults help youth" to "**How can youth and adults help each other**"?

Youth Engagement Best Practices

To understand the best practices when engaging with youth, we looked to the experts—youth! This section is primarily informed by local youth and service provider voices. Please keep in mind that there is not one prescribed method when engaging with youth, and it will look different depending on context. Youth want to know that their involvement is valued, their experience is worthwhile, and they are having an impact. It is helpful to think about youth engagement as a collaborative process, rather than an end result or a specific program^{xiii}. This process involves exploring together, continuous reflection, evaluation, and change. Our membership and local youth highlight some things to think about when engaging youth^{xiv}:

Communication

- Communication and learning styles may look different depending on the purpose and who you are communicating with.
 - 💡 There are various modes of communication—ask what method works best (e.g. texting, calling, social media). There are different learning styles—ask what works best (e.g. visual, auditory, reading/writing, kinesthetic).
- Set clear expectations. This may include roles, responsibilities, and accountability measures. Have a conversation and create these together because expectations go both ways.
- Be transparent and let youth know what is going on.
 - 💡 Provide regular updates through avenues that work for everyone. If you asked for their thoughts and ideas, share how you are using their input.

Be Prepared

- It takes time, effort, and planning to create a space for success. Ask questions to know who is attending and what is needed.
- To show respect for the commitment and time youth are giving, have the space and required materials ready for full participation.
 - 💡 Work together to develop a plan, so you know what is needed.

Meet Youth Where They Are At

- Meet youth at a time that allows for participation. Just like adults, youth have responsibilities (e.g. school, work, family). This means there will need to be flexibility in when you meet.
 - 💡 Keep in mind the time of year—are exams coming up? Are there any cultural or religious considerations?
- Transportation can be tricky, so keep in mind where you meet. This could mean providing transportation supports, depending on youth needs.
- Create spaces for youth with diverse experiences. Communicate with youth to know who is coming and what is needed.
 - 💡 Tailor supports to the youth's needs. Some youth might require child care, an interpreter, or a support professional.

Safe Spaces

- Create a space where everyone feels they are welcome, accepted, and that they belong. A safe space is created through the overall environment of the space, whether it is a physical space or online. Work with youth to create an atmosphere that meets diverse needs and wants.

- Support opportunities for youth to establish a sense of ownership in the space. Ask youth what they want and work alongside each other when creating a space meant for them.
 - 💡 It may range from deciding on a park or a coffee shop to meet at, to colour schemes and design of an online hub.
- Allow for everyone to feel valued and included.
 - 💡 Work together to develop group guidelines to help create a safe and welcoming space for all.

Show Appreciation

- Provide food! Decide together on what snacks would be most enjoyed.
- Provide an honorarium! Chat with the youth to get their ideas on what would be best to show appreciation for their participation.
 - 💡 It could be gift cards, “merch” for the project, etc.
- Value all participation and input! Give thanks and credit where it is due.
- Every success is important! Celebrate all achievements—big and small!

Adult Allyship

Adult allies are the bridge between individual youth and the systems that affect their lives^{xv}. This is a big responsibility! Adult allies play a critical role in navigating between youth and systems to understand factors impacting engagement and identifying opportunity for linkages and partnerships^{xvi}.

Youth and service providers in our community identified some key characteristics of successful intergenerational partnerships^{xvii}. An **adult ally** is someone who...

- recognizes youth have something meaningful to contribute
- is empathetic and supportive
- works in collaboration
- intentionally listens
- practices reflexivity and acknowledges power imbalances
- is willing to learn, change their mindset, and work in new ways
- shares power and decision-making opportunities

Exploring our biases and assumptions

As adult allies, we need to practice reflexivity to become aware of the opinions, beliefs, and values informing our role in the relationship. Understanding our own biases and assumptions, and those ingrained in our organizations, allows us to begin the process of addressing them. This opens us up to new ways of working in partnership with youth. Here are some key questions to ask yourself:

- What are my (and my organization’s) biases and assumptions about the role of adults and youth in society? Where do these assumptions come from? How can I work on shifting my mindset and letting these assumptions and biases go?
- What power do I hold as an adult in society? What power does my organization/position hold? How is this power exerted on the youth I work with? How can I (and my organization) work on redefining these roles?
- What does it mean for me (and my organization) to work in partnership with youth? What are the barriers I may face to authentically engaging and working with youth? What benefits do I bring into a partnership?

Adult and Youth Partnerships

It all starts with relationships! Every relationship is different and dependent on the context in which it is built. However, there are a few things that are always good to keep in mind as we enter into opportunities for partnership.

What opens opportunities and/or creates barriers to youth participation?

As allies, we need to be aware of what barriers may be preventing youth from participating. These might be structural (e.g. youth unable to physically access a meeting space) or systemic (e.g. youth labeled as “disengaged” and so not included). It is also important to note why engaged youth do become engaged^{xviii}. By having conversations with youth who are and are not engaged, we can better understand why. We also need to continue asking, and keep communication lines open to understand what barriers youth may face in sustaining engagement. With a clearer understanding of barriers and entry points we, as adults, can better advocate to have resources in place that support engagement.

To meet youth where they are at, we need to know where they are at. To know where they are at, we need to ask them.

How do youth want to be engaged? What topics do they want to be engaged on?

As adult allies, we need to practice intentional listening.

Youth are the experts of their own lives. We need to acknowledge our assumptions through reflexive practice, and do the work to leave these assumptions at the door. Keep in mind that what adults want youth to be engaged on, may differ from what youth want to be engaged on. The same might be true with the engagement avenues we offer.

- 💡 Ask youth what they are excited and passionate about to understand where and how they want to get involved. Offer multiple entry points, from low-risk engagement opportunities to those with deeper involvement^{xix}. This allows for youth to engage in ways that feel comfortable for them.

How do we build and sustain relationships?

To truly work in collaboration with youth, we as adults need to contribute to building trust. Trust, and how we build it, varies across individuals and situations^{xx}.

Our conversations with youth, service providers, and the literature show that there are a few key things to consider when building trust and entering into intergenerational partnerships:

- **Start by listening to understand.** Have you ever experienced a time when you are listening to a youth and feel tempted to jump to solutions or advice? Or, as youth speak, you are situating their experience in your own understanding of being a youth? When adults do this, we are working from the assumption that we know best, and the experiences of youth today are the same as our own experiences were. When we listen to understand, we can move into co-created action to address the issue.
 - 💡 Host listening sessions where youth and adults ask “why” questions to understand each other’s perspectives. As we heard at a community event: less telling, more asking.

“When I realized that [service providers] are **willing to hear our voice** instead of push us aside; [that you] want to take in what we’re saying, really appreciate it and acknowledge it, **I feel hopeful.**” (Youth Participant)

- **Acknowledge and address power dynamics—but do not go “all or nothing.”** There will always be power imbalances in intergenerational partnerships. Being open and honest about how these imbalances impact the relationship is a key piece in moving forward and figuring out how to shift ideas about youth-adult roles^{xxi}. Additionally, adults often fall into the trap of “giving power” in partnerships, in an attempt to recognize and address power imbalances. Sometimes, yes, great things come from moving aside and allowing space for youth to exercise power. However, by completely stepping aside, we miss out on the opportunity to leverage our personal and institutional power for the betterment of the partnership. We want to move away from “power giving” and towards “power sharing”^{xxii}.
 - 💡 Be clear about roles, responsibilities, and boundaries to ensure that power sharing does not turn into adults overstepping.
- **Challenge assumptions and continue to engage through the discomfort.** Working with those who think differently than you may lead to moments of discomfort. Challenges to ingrained power dynamics and status quo may also lead to discomfort. The key is to stay committed, work through the discomfort, and be open to learning from youth. At the CYPT, we have made a shared commitment to relentlessly strive to maximize wellbeing. This means staying at the table when things get tough.
- **Dedicate time to get to know each other.** Leave time and space for youth and adults to connect, show interest, and learn about each other—apart from the goal or project^{xxiii}.
 - 💡 Incorporate check-in and check-out opportunities, or regular ice breakers into every meeting to encourage everyone to get to know each other.
- **Be transparent and practice open communication.** Adult transparency around possible opportunities and constraints in the partnership helps to level the playing field^{xxiv}. Remember to be mindful about where there is flexibility for youth input (and organizational action on that input) and where there is not. Be transparent about these opportunities as well, and be honest when the input can not be used. True collaboration can only happen when everyone is working with the same information and valued as equal partners.
- **Partnership is a two-way street.** Research shows that the most successful intergenerational partnerships are those founded on a common goal or purpose, rather than those solely focused on mentorship or youth development^{xxv}. Framing the partnership around a common goal reinforces that youth are capable and have something to contribute now^{xxvi}. Doing this also encourages shared accountability. Work together, learn together, fail together, and succeed together.

A note to adults and organizations:

A key to being a good adult ally is leveraging your power and continuing to advocate for the inclusion of youth in all decisions that affect them. It is not a simple task! It requires a commitment from both you and your organization. Adults doing this work “require support and resources to challenge conventional adult roles of authority and power over youth”^{xxvii}. We have to work to shift not only our own mindsets, but organizational and societal mindsets about the innovative role of youth in affecting community change.

Interested in Learning More?

The information in this resource is the first step to inform your skills in engaging youth in your work. Take a look at these additional resources to deepen your knowledge and continue your learning journey!

Frameworks

- Hart's Ladder of Participation
- Attachment, Regulation and Competency (ARC) Framework
- The Developmental Assets Framework

Toolkits

- Pan-Canadian Joint Consortium for School Health (JCSH) Youth Engagement Toolkit
- Adult Allies in Action
- Safe at School Youth Empowerment
- Youth Centred Design Toolkit
- Youth Engagement Toolkit Resource Guide
- Ready...Set...Engage! Building Effective Youth/Adult Partnerships for a Stronger Child and Youth Mental Health System
- Ontario Centre of Excellence for Child and Youth Mental Health Youth Engagement Toolkit

The members of **the Children and Youth Planning Table** intentionally connect to planning bodies across the community and work together to collectively mobilize as one system for children and youth that relentlessly strives to maximize wellbeing, throughout generations.

website: childrenandyouthplanningtable.ca

twitter: @CYPTWR



**Children and Youth
Planning Table**
of Waterloo Region

Notes

- ⁱCamino, Linda, "Pitfalls and Promising Practices of Youth-Adult Partnerships: An Evaluator's Reflections", *Journal of Community Psychology* 33, no.1 (2005):75-85,
<https://fyi.extension.wisc.edu/youthadultpartnership/files/2015/04/Camino-Pitfalls-and-promising.pdf>
- ⁱⁱIbid., p. 79
- ⁱⁱⁱCamino, "Pitfalls and Promising"; Ho, Elaine, Clarke, Amelia and Ilona Dougherty, "Youth-led Social Change: Topics, Engagement Types, Organizational Types, Strategies, and Impacts", *Futures* 67, (2015):52-62,
<https://www.sciencedirect.com/science/article/pii/S0016328715000075>
- ^{iv}Bolton, Gillie, and Russel Delderfield, "Reflective Practice: An Introduction." *In Reflective Practice: Writing and Professional Development* (New York: SAGE Publications Ltd, 2018), 1-24.
- ^vKhanna, Nishad and Stoney McCart, *Adult Allies in Action*, (Toronto: The Centre of Excellence for Youth Engagement, 2007),
https://studentscommission.ca/assets/pdf/en/publications/Adults_Allies_in_Action.pdf
- ^{vi}Dougherty, Ilona and Amelia Clarke, "Wired for Innovation: Valuing the Unique Abilities of Emerging Adults", *Emerging Adulthood* 6, no. 5 (2018):358-365, <https://doi-org.libproxy.wlu.ca/10.1177%2F2167696817739393>
- ^{vii}Ibid.
- ^{viii}Ibid.
- ^{ix}Overlap Associates, *Session Output: Children and Youth Planning Table Problem Mapping Session*, (Waterloo Region: CYPT, 2018).
- ^xDougherty & Clarke, "Wired for Innovation".
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8. Best Practices for Youth Engagement

During the engagement process, SWR received partner and participant feedback that enabled the creation of a list of lessons learned and best-practices for moving forward with future SWR activities and engagements. Many of these are portable; they will help other communities across Canada consider the methods, scope and reach of efforts to implement child and youth well-being initiatives.

Relationships

- Prioritize relationship-building with community partners and individuals
- Design activities/sessions that are mutually-beneficial for Smart Waterloo Region, hosts and individuals participating

Communications

- Provide many methods of communication to participants and varied methods for participants to contribute
- Engage rural and other under-represented community members through online tools (e.g., French survey, feedback from rural groups)
- Provide online mechanisms to engage youth and multilingual engagement
- Enable communication – time and tools – for people with disabilities

Diversity

- Consider locations that allow participants to walk or talk transit easily
- Include diverse geographic and neighbourhood locations
 - Rural, suburban, urban
 - Across municipalities and townships
 - Neighbourhoods with different demographics (race/ethnicity, newcomer populations, socio-economic status)
- Simplify language (reading level tests) and provide image-based communications
- Provide adequate time for potential participants to respond to application processes
- Ensure processes are inclusive to those with disabilities and/or language barriers

Accessibility

- Provide at least four-weeks notice for participants to book accessible transportation and support workers, if needed
- Choose accessible locations, including accessible and gender-neutral bathrooms
- *Events*
- Based on feedback from youth, hold shorter, more frequent events fewer, focused activities
- Create more community-led activities using toolkits so people feel empowered
- Design activities and workshops that are mutually-beneficial for SWR, hosts and individuals participating

Reach

Appendix A.

- Prioritize relationship-building with community partners and individuals
- Engage youth through youth leaders
- Create a community youth ambassadors to help generate awareness of projects among younger demographics
- Provide transportation support – bus tickets, locations with close and free parking, chartered buses – to make ensure the widest possible diversity of participants

Facilitation

- Use open-ended questions
- Always share how contributions will be used
- Gather contributions that can be used meaningfully (e.g., Don't ask for feedback on the colour, if colour cannot be changed)
- Have extra facilitators in case participants require one-on-one support
- Tailor facilitators to group needs (i.e., language support)

Appendix A.

9. Root Causes: Stakeholder Lab Results and Interconnected Problem Map

Appendix A.

Session Output

Children and Youth Planning Table Problem Mapping Session

TUESDAY, JUNE 12, 2018
Kitchener, Ontario

Revised, July 6, 2018

**Overlap
Associates**



**Children and Youth
Planning Table**
of Waterloo Region

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Introduction

Waterloo Region is embarking on an exciting journey to become the benchmark community in Canada for child and youth well-being. The Children and Youth Planning Table of Waterloo Region has made incredible strides convening people and organizations around a shared vision for children and youth in the region. The work of the Planning Table is establishing a new standard for understanding child and youth wellbeing, collaborating across organizational boundaries, and for involving children and youth in decisions around their wellbeing.

Building on this work and the work of Wellbeing Waterloo Region, the Region of Waterloo has been shortlisted for the Canada-wide Smart Cities Challenge, with a focus on healthy children and youth. An extensive network of partners are aligning around this ambitious goal, including UNICEF Canada.

On June 12th, the Children and Youth Planning Table of Waterloo Region brought together 174 participants to explore the obstacles to wellbeing children and youth face in this region. This included youth, parents, and representatives of child-serving organizations.

Participants worked in groups to identify obstacles in each of six priority areas, using a consensus building approach that combined and extended individual's ideas to a set of overarching themes. Unpacking and exploring the many factors that prevent us from moving the needle on child and youth well-being is an important first step in improving. By better understanding the problem from the perspectives of those involved, we can develop better solutions. Clearly defining problems provides a crucial foundation and a common understanding for child- and youth-focused initiatives in Waterloo Region moving forward.

Our Vision



**Children and Youth
Planning Table**
of Waterloo Region

Children and Youth Planning Table of Waterloo Region

Happy, healthy children and youth
today and tomorrow.



UNICEF Canada | One Youth Goal

Make Canada the best place in the world
for kids by 2030.



Waterloo Region's Smart City Challenge Statement

We will become the benchmark community in
Canada for child and youth wellbeing by using
early intervention, youth engagement and a
connected-community framework to create
adaptive, data-driven programs and scalable
learning technologies that improve early child
development, mental health and high school
graduation rates.

“If faced with the opportunity to talk with adults, take it. You can preach about student voice all you want with other students, but nothing’s going to get done without adults. You have to work with adults.”

YOUTH PARTICIPANT, PROBLEM MAPPING SESSION

Six Priority Areas

The goal of the day was to map the problems that prevent us from improving child and youth well-being in six priority areas:



Bullying



Early Childhood Development



High School Graduation



Literacy



Mental Health



Sense of Belonging

This report provides a description of each priority area, a capture of the obstacles identified, an overview of youth involvement in the process, and a summary of themes that emerged across the priority areas.

Youth Involvement

The Children and Youth Planning Table recognizes the importance of involving youth in problem definition and in ongoing efforts to tackle challenges in the six priority areas.

Youth participants were recruited in partnership with the three school boards with high schools in Waterloo Region (Waterloo Region District School Board, Waterloo Catholic District School Board and Mon Avenir). Youth involved in Carizon's Pathways to Education were also asked to participate, if interested and able. In total, sixteen youth attended the problem mapping sessions.

One of the major takeaways from the day was the impact of having youth participation. Youth and adult participants alike shared a desire to have more youth in attendance at future events. While the youth turnout was lower than desired, it provided an excellent

base to build from, and the value of having the youth perspective was very clear. Youth participants had ideas for increasing the level of youth engagement, including hosting events in schools, involving university students and grade 7 & 8s, and recruiting youth delegates to have conversations with their peers and report back. Outcomes from this event will be able to inform future strategies for recruiting youth participants and help grow a network of involved youth.



“Have more experiences like this for students. When we’re given that opportunity, it’s really valuable”

YOUTH PARTICIPANT, PROBLEM MAPPING SESSION

COMMENTS FROM YOUTH PARTICIPANTS

“I’m hopeful that you, as adults, are willing to look at youth and take our voice, because you invited us all here and are listening. Honestly, I wouldn’t expect that because you’re so busy with your own lives.”

“Youth and adults have been able to identify similar problems. If we weren’t on the same page, it would be very difficult. Although there’s some misunderstanding, it’s great that we’re able to find common understanding.”

“When I realized that you guys, as faculty members, are willing to hear our voice instead of pushing us aside, you guys want to take in what we’re saying, really appreciate it and acknowledge it, I feel hopeful.”

COMMENTS FROM ADULT PARTICIPANTS

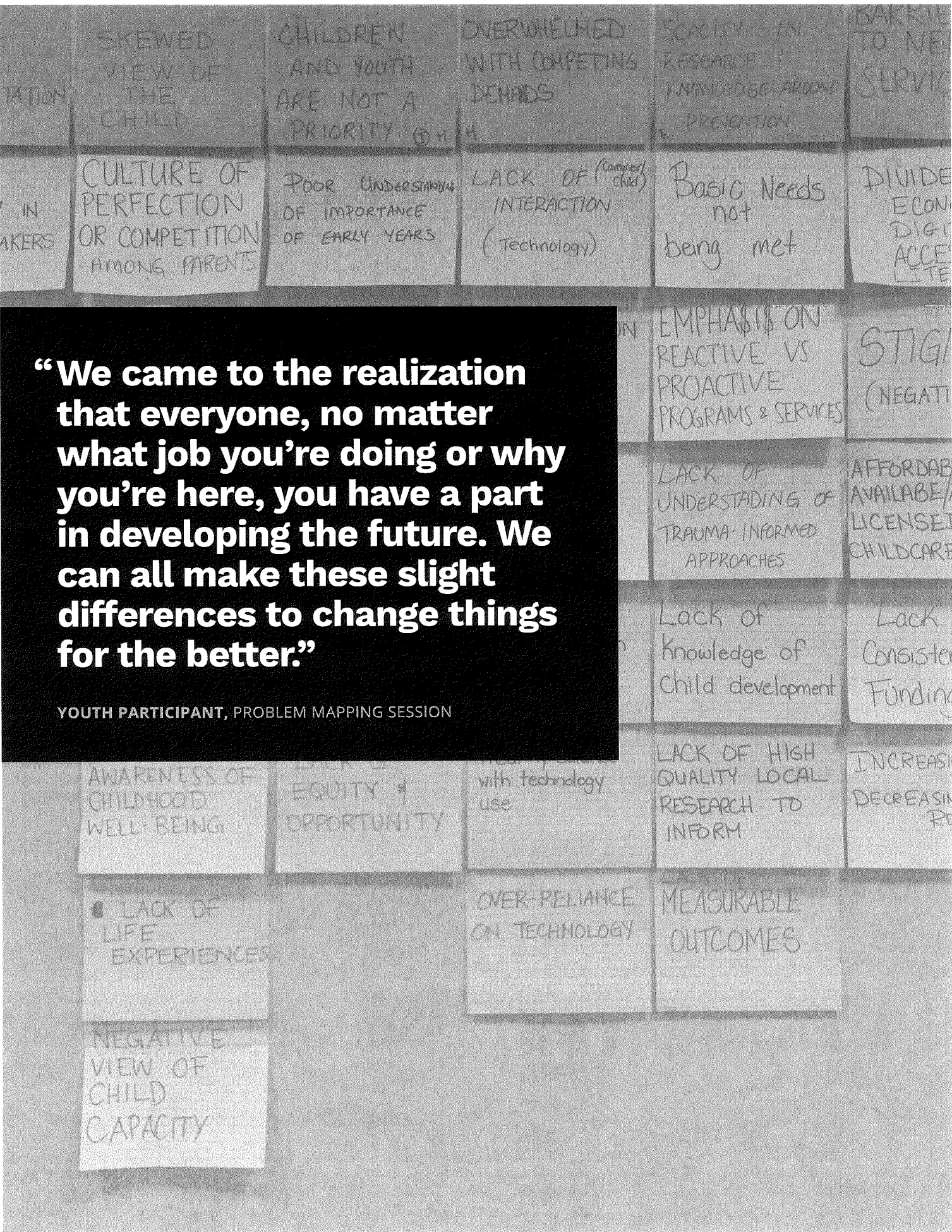
“I’m hopeful because we have such strong youth presence. And you [youth] are articulate and say what needs to be said and challenge us, and we’re grateful you took the time to be here today.”

“As a result of today, with the youth present and seeing their impact, I hope that we as service providers will be more intentional in including youth voices in our service planning and in our programming.”

“We are all here together today talking about these issues that everyone faces—not just youth—and we have the presence of youth and adults trying to move forward on these issues.”

“We came to the realization that everyone, no matter what job you’re doing or why you’re here, you have a part in developing the future. We can all make these slight differences to change things for the better.”

YOUTH PARTICIPANT, PROBLEM MAPPING SESSION

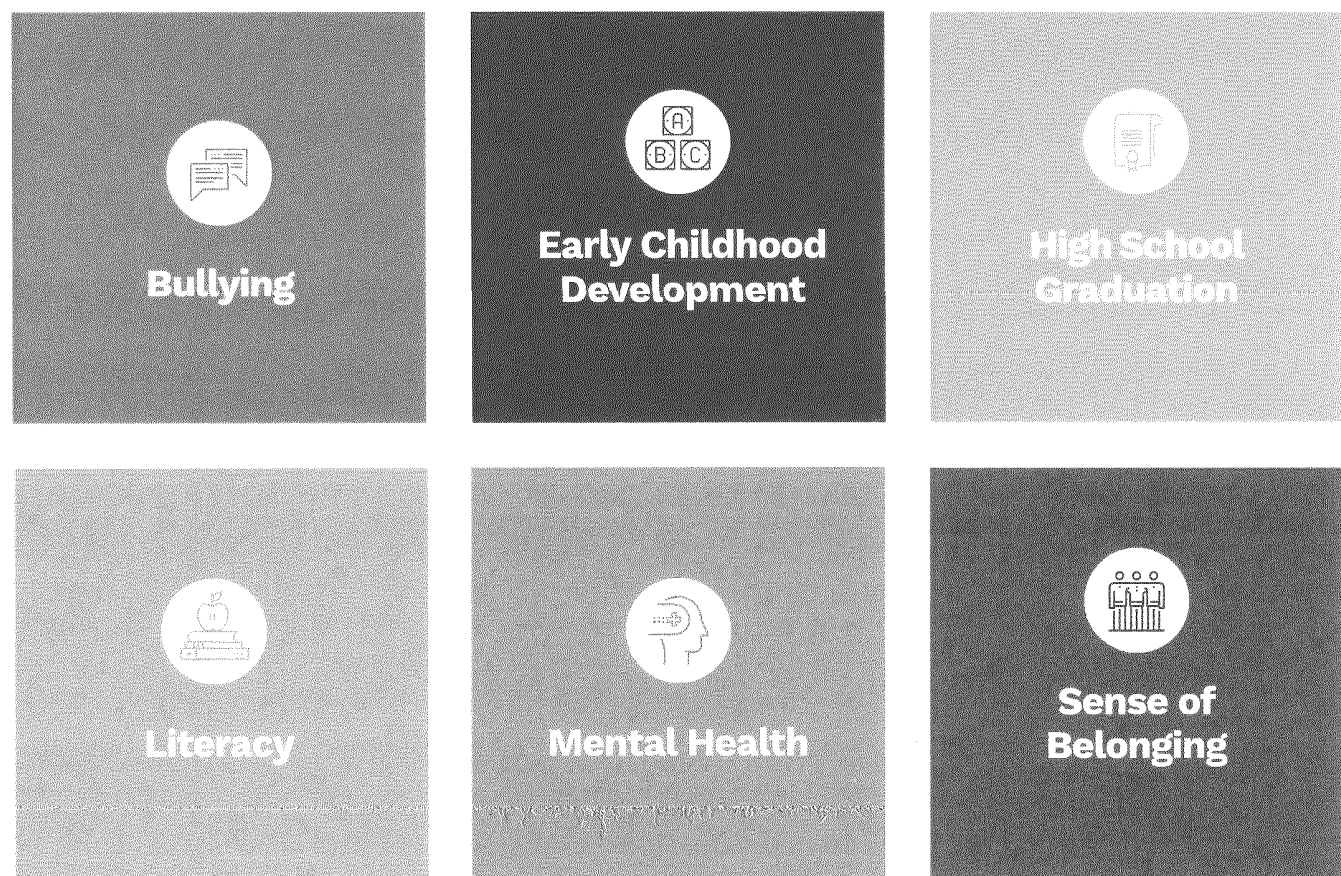


Problem Mapping the Six Priority Areas

A Problem Map is a visual depiction of all the contributing factors within a problem space, including sets of problems, symptoms, and root causes. It's an important first step in unpacking the many elements of complex social problems like improving child and youth wellbeing. Spending time to explore the problem at the outset of a project ensures problem-solving efforts are focused, saving time and energy. For this ambitious, ten-year-long initiative, developing a deep, holistic, and child- and youth-informed understanding of the problem is vital.

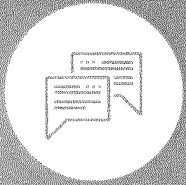
This section of the report presents a problem map for each of the **six priority areas**. The language used in each problem map reflects how participants chose to communicate the obstacles they identified, edited for clarity where necessary.

The group identified obstacles in six priority areas.



Preliminary Indication of Priority:





Bullying

Bullying comes in many forms and can include emotional and psychological as well as physical violence.

Bullying can affect physical and emotional health, both in the short term and later in life. It can lead to physical injury, social problems, emotional problems, and even death. Those who are bullied are at increased risk for mental health problems, headaches, and problems adjusting to school. Bullying also can cause long-term damage to self-esteem. Children and adolescents who are bullies or bullied are at increased risk for substance use, academic problems, and violence to others later in life.

What is preventing us from stopping bullying in Waterloo Region?

- Ineffective Response
- Entrenched Belief System
- Turning a Blind Eye
- Community Inaction
- Dehumanization
- System Breakdown
- Lack of Meaningful Connection

Ineffective Response

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INEFFECTIVE RESPONSE

- Loss of control—victims have no viable response
- Lack of confidence in authorities (school admin, parents, police services, management)
- Fear of retaliation
- Victim shaming and peer pressure
- Anti-bullying student leaders may be culprits

Entrenched Belief System

H

ENTRENCHED BELIEF SYSTEM

- Lack of understanding of bullying behaviours, power dynamics
- Not understanding the variations of bullying
- Lack of a clear definition
- Stereotypes and labels
- Cultural and generational barriers
- Our own biases

Lack of Accountability

E

LACK OF ACCOUNTABILITY

- Lack of accountability and responsibility
- Awareness
- The by-stander effect
- Lack of restorative justice options
- Invisibility (no one sees it)
- Nothing done in the moment

Community Inaction

COMMUNITY INACTION

- Lack of parental collaboration (community support)
- Social inequity
- Understanding root causes (culture, home life, unknown)
- Emphasis on reactive vs. proactive
- Lack of protective factors (e.g. self-regulation, attachment, initiative)
- Not understanding cultural differences

Dehumanization



DEHUMANIZATION

- Hiding behind anonymity
- Celebrating bullying role models
- Lack of empathy
- Social media makes it easy
- People are self-absorbed
- Lack of a compassionate society
- Do parents know what to look for? (signs and symptoms)
- "ISMs" (racism, ageism, etc.) and othering
- Sense of entitlement

System Breakdown

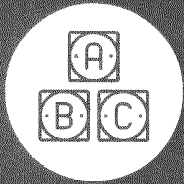
SYSTEM BREAKDOWN

- Feels too big/complicated to solve
- Lack of best practices
- Lack of ownership
- Zero tolerance policies
- Lack of resources (knowledge, physical resources, policies)
- Lack of system leadership
- Confidentiality agreements

Lack of Meaningful Connection

LACK OF MEANINGFUL CONNECTION

- Lack of face-to-face communication (e.g. reliance on tech)
- Lack of offline social networks
- Understanding self-worth
- Not supporting both bully and victim
- No sense of community, belonging
- Lack of social skills



Early Childhood Development

The early years—from conception to age six—have the most important influence of any time in the life cycle on brain development and subsequent learning, behaviour and health.

Children develop at an astonishing rate in the early years. They are impacted by early experiences and relationships that help guide healthy cognitive, emotional, and social development. Investing in the early years has a direct impact on economic, social, and health outcomes for both individuals and society. Children who are prepared to learn as they enter school are more likely to meet demands and benefit from educational activities. This sets the stage for success in many other areas of life.

What are the obstacles to healthy early childhood development in Waterloo Region?

- Systemic Lack of Representation
- Skewed View of the Child
- Children and Youth Are Not a Political Priority
- Families are Overwhelmed with Competing Demands
- Scarcity in Research and Knowledge around Prevention
- Barriers to Needed Services
- Childhood is Seen as a Womans' Issue
- Family Stressors

Systemic Lack of Representation

E

SYSTEMIC LACK OF REPRESENTATION

- Lack of diversity in policy makers
- Lack of culturally inclusive, safe spaces
- Real or perceived barriers to services (e.g. fear of losing child, stigma of asking for help)
- Lack of trust with “the system”

Skewed View of the Child

SKEWED VIEW OF THE CHILD

- Culture of perfection or competition amongst parents
- Health concerns—mental and physical
- Fear of risky outdoor play
- Parental awareness of childhood wellbeing
- Children seen as commodity for the future (looking at kids in terms of what they will become, not what they are right now)
- Lack of life experiences—youth contributions dismissed because they lack experience
- Negative view of child capacity

Children and Youth Are Not a Political Priority

I H

CHILDREN AND YOUTH ARE NOT A PRIORITY

- Poor understanding of the importance of the early years
- Waitlists for all services
- Government structure has short term focus
- System doesn’t reach all families
- Lack of equity and opportunity

Overwhelmed with Competing Demands

H

OVERWHELMED WITH COMPETING DEMANDS

- Lack of caregiver/child interaction (technology)
- Busyness of families
- Lack of family-centred approach
- Healthy balance with technology
- Prioritization of time
- Over-reliance on technology

Scarcity in Research and Knowledge around Prevention

E

SCARCITY IN RESEARCH AND KNOWLEDGE AROUND PREVENTION

- Emphasis on reactive vs. proactive programs and services
- Basic needs not being met
- Lack of understanding of trauma-informed approaches
- Lack of knowledge of child development
- Lack of high quality local research to inform
- Lack of measurable outcomes

Barriers to Needed Services

BARRIERS TO NEEDED SERVICES

- Divides: economic, digital, access, literacy
- Stigma—embarrassment to accessing services and programs
- Affordable and available/accessible licensed childcare
- Lack of consistent funding
- Increasing needs, decreasing resources

Childhood is seen as a Woman's issue

CHILDHOOD IS SEEN AS A WOMANS' ISSUE

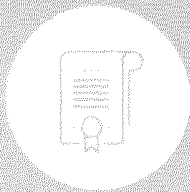
- Not on Radar of policy makers, politicians, anyone without kids 0-6
- Lack of societal value for the early years
- Lack of qualified and experienced educators
- Gender bias (women's roles)
- Lack of support for professional development

Family Stressors



FAMILY STRESSORS

- Lack of awareness of resources
- Too easy to make least healthy choice
- Poverty—lack of social housing, food insecurity, low income
- Intergenerational cycles—skills, literacy, poverty, parenting, etc.
- Literacy levels of parents



High School Graduation

Learning opportunities give children and youth the space to develop a variety of skills and abilities.

Experiencing success in school is an important component of lifelong learning and overall wellbeing for children and youth. Health and living standards, in particular, are positively influenced by educational attainment—higher levels of education and income allow greater access to safe and healthy living conditions and other resources. High school completion is linked to future educational success, higher incomes, and a higher quality of life.

What obstacles do youth face in graduating High School in Waterloo Region?

- Lack of Foundational Support
- External Responsibilities of Students
- Not Meeting Students Where They're At
- Lack of Understanding of Student Success
- Lack of Engagement and Inclusion
- Lack of Student-Centred Approaches
- Inadequately Supported Graduation Requirements (Academic and Volunteer)
- Lack of Understanding of the Implications of Programs on Sense of Belonging

Basic Needs Are Not Met

1

BASIC NEEDS ARE NOT MET

- Lack of basic needs being met
- Lack of resources to ensure educational success
- Social determinants of health (housing stability, food security)

Basic Skills Are Not Developed Early On

1

BASIC SKILLS ARE NOT DEVELOPED EARLY ON

- Lack of emphasis on the importance of early years
- Insufficient investment in the early years
- Limited math and literacy skills
- Learning time management

External Responsibilities of Students

EXTERNAL RESPONSIBILITIES OF STUDENTS

- Personal obligations/conflicting priorities
- Economic challenges
- Range of external pressures (poverty, work, cultural values, "better" options)
- Lack of support to teenage parents—no available childcare
- Religious, cultural, parental expectations

Not Meeting Students Where They're At

NOT MEETING STUDENTS WHERE THEY'RE AT

- Not meeting students where they are at
- Disconnect—"What's the point?"
- Mental health
- Alcohol/substance abuse
- Undiagnosed learning and mental health issues
- Low self-esteem in students

Lack of Understanding of Student Success

LACK OF UNDERSTANDING OF STUDENT SUCCESS

- Lack of a trauma-informed lens
- Lack of meaningful support—parents, caring adults outside school
- Educator lack of understanding of brain development
- Lack of flexibility in high school timetables (course conflicts, cancellations, minimum required credits)
- Lack of focus on student success vs. high school graduation

Lack of Engagement and Inclusion

LACK OF ENGAGEMENT AND INCLUSION

- Language and cultural barriers
- Negative social environment (e.g. peer groups, neighbourhood, family structure)
- Lack of engagement
- Discrimination, lack of inclusivity
- Lack of diversity and representation
- Ongoing conflicts at school
- Lack of nimbleness to adapt to differences (in learning, in needs, in personality, in culture, etc.)

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Lack of Student-Centred Approaches

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LACK OF STUDENT-CENTRED APPROACHES

- Lack of innovative pedagogies (ways of teaching)
- Didactic (lecturing, not interactive) approach to teaching limits participation and is not suitable for all
- Rigid school system
- Youth have a lack of opportunities to co-create their education
- Lack of student-centred learning
- YAWN! Content not being relevant
- School funding policy
- One size fits all policies
- Is the “value” of a high school education shared by everyone? Does it have to be?

Inadequately Supported Graduation Requirements (Academic and Volunteer)

E

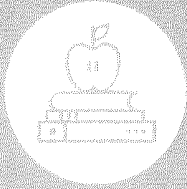
INADEQUATELY SUPPORTED GRADUATION REQUIREMENTS (ACADEMIC AND VOLUNTEER)

- Lack of academic support
- Lack of resources to achieve mandatory 40 volunteer hours—recommended to get hours before entering high school, but youth aren't told about the requirement or supported to find volunteering opportunities at that time
- Unrealistic homework loads which deter students from finishing school

Lack of Understanding of the Implications of Programs on Sense of Belonging

LACK OF UNDERSTANDING OF THE IMPLICATIONS OF PROGRAMS ON SENSE OF BELONGING

- Value of special ‘magnet’ schools vs. creating two populations and social inclusion issues
- Lack of meaningful connection
- Lack of mentorship opportunities (youth, adult, male role models)



Literacy

Literacy means having the reading, writing, speaking, and numerical skills to effectively understand and participate in the world around you.

Literacy is strongly connected to wellbeing. Health Canada identifies literacy as a major determinant of health. Children who read or are read to are more prepared for learning when they enter school, have stronger language and social-emotional skills throughout their childhoods, and reap the benefits of these early skills throughout their lives.

Research has established a strong connection between literacy and economic security and wellbeing. Canadians with weaker literacy skills are more likely to be unemployed, work in lower-paying jobs and live in low-income households.

What's stopping us from moving the needle on low literacy rates in Waterloo Region?

- Relationships are Not Prioritized in Fostering Learning
- Personal Context of Parents and Families
- Misperceptions of Literacy
- Intergenerational Cycle of Poverty and Low Literacy
- Literacy is Low on the List of Priorities at Home and at School
- Lack of Consideration of Diverse Needs
- Literacy is a Life-long Process

Relationships are Not Prioritized in Fostering Learning

RELATIONSHIPS ARE NOT PRIORITIZED IN FOSTERING LEARNING

- Lack of face-to-face interaction
- Lack of attachment (often due to parent capacity)
- Busyness of lifestyles
- Lack of awareness of pre-literacy activities
- Lack of knowledge of literacy milestones
- Lack of awareness of parents/caregivers as first teacher
- Competition for attention (between technology and face-to-face reading)

Personal Context of Parents and Families

PERSONAL CONTEXT OF PARENTS AND FAMILIES

- Stigma (hidden issue)
- Unique challenges for ELL (English Language Learner) families
- Cycle of low literacy
- Lack of understanding of impact of low literacy
- Parents' past experiences with literacy
- Lack of clear language in services
- Lack of representation in literature

Misperceptions of Literacy and Roles

MISPERCEPTIONS OF LITERACY AND ROLES

- Lack of knowledge of the connection between play and literacy
- Literacy is not seen as a family issue
- Sentiment that "It's just a school problem"
- Parent perception of literacy
- Understanding the importance of literacy in many forms
- Education system makes assumptions about parents' literacy skills
- Changing definition of literacy

E

Intergenerational Cycle of Poverty and Low Literacy

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INTERGENERATIONAL CYCLE OF POVERTY AND LOW LITERACY

- Not connecting literacy to other determinants (poverty, mental health, high school graduation rates)
- Disparity in school readiness
- Literacy is not sexy
- Low literacy among parents
- Intergenerational problem
- Poverty—inability to fulfill basic needs

Literacy is Low on the List of Priorities at Home and at School

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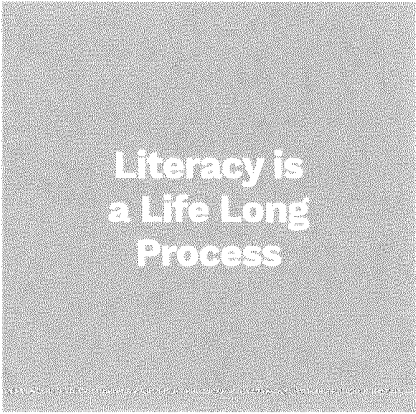
LITERACY IS LOW ON THE LIST OF PRIORITIES AT HOME AND AT SCHOOL

- Impacts of technology (spelling, grammar, writing)
- Overwhelmed homes and classrooms
- Literacy is not identified as a priority
- Lack of awareness of community resources
- Lack of skills/resources in the educational system to support family literacy
- Competing curriculum demands
- No universally agreed upon definition (e.g. numeracy, digital literacy, physical literacy, media literacy, etc.)

Lack of Consideration of Diverse Needs

LACK OF CONSIDERATION OF DIVERSE NEEDS

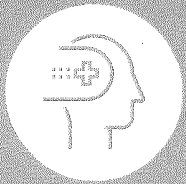
- Newcomers may not be school ready
- Multilingual population with English testing
- Unidentified hearing and vision issues
- Other pressing priorities
- Lack of assessment tools to capture accurate measures
- Conflating English as a Second Language (ESL) with illiteracy
- Attention spans and concentration seem lower



Literacy is a Life Long Process

LITERACY IS A LIFE LONG PROCESS

- Limited understanding of early childhood literacy development
- Lack of access to programs and services
- Lack of access to support once out of school
- Inaccurate data and data collection methods to identify people who would benefit from literacy support after school



Mental Health

Mental health refers to the way we feel, think, act and interact with the world.

Youth with positive mental health are better able to cope with problems, stressors, and other difficulties. Children and youth with good mental/emotional health can understand and manage their emotions and the emotions of others. This contributes to building healthy relationships and the ability to cope with challenges.

What are the obstacles to moving the needle on child and youth mental health in Waterloo Region?

- Knowledge Barriers
- System Rigidity
- Societal and Social Expectations
- Uncoordinated System—Lack of Prevention and Planning
- Youth Needs are Not Heard
- Personal Readiness
- Lack of Process, Systems, and Solutions

Knowledge Barriers

KNOWLEDGE BARRIERS

- Lack of training and resources
- Intellectual barriers
- Stigma—stigma that stems from not viewing mental health as a health issue, but as something to “get over” or as a personal failing
- Lack of caregiver education
- Not understanding trauma
- Lack of awareness re: what is a mental health concern

System Rigidity

SYSTEM RIGIDITY

- School system rigidity/silos
- Supports and access in school
- Limited access
- Not enough specialized services for dual diagnosis
- Too narrow in focus (e.g. services specific to diagnosis, viewing addictions as a separate issue)

Societal and Social Expectations

SOCIETAL AND SOCIAL EXPECTATIONS

- Social media is isolating
- Societal pressures
- We’ve lost the village that surrounds our kids
- Lack of boundaries (social media)

Uncoordinated System—Lack of Prevention and Planning

I

UNCOORDINATED SYSTEM — LACK OF PREVENTION AND PLANNING

- Not addressing basic needs
- Family and community support
- Too many band-aid solutions
- Lack of coordinated early prevention
- Impact of adult mental health
- Poverty, toxic stress (toxic stress refers to children experiencing prolonged adversity without adequate adult support, which interferes with development)
- Lack of system ownership and knowledge

Youth Needs are Not Heard

E

YOUTH NEEDS ARE NOT HEARD

- Parents as gatekeeper
- Cultural barriers to getting support
- Youth voice not valued
- Not seeing full value of youth perspective

Personal Readiness

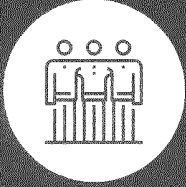
PERSONAL READINESS

- Lack of self-awareness
- Some people don't want to help
- Stigma—some uncomfortable with potential label
- Lack of trust

Lack of Process, Systems, and Solutions

LACK OF PROCESS, SYSTEMS, AND SOLUTIONS

- Unclear definition of children's mental health
- "Mental health" is too broad
- Lack of public policy implementation
- Little long-term planning/support
- Lack of system leadership
- Difficult to access help and difficult process
- Lack of recognition and understanding of issues and services
- The waiting game



Sense of Belonging

Having a sense of belonging means feeling valued, heard and included, feeling welcomed, and feeling like part of a community.

A sense of belonging is an important component of mental health and overall wellbeing. Feeling a social and environmental connection gives children and youth a sense of stability, helping them deal with challenges and uncertainty. Those with a strong sense of belonging are more likely to have social networks and be engaged in their community.

What's standing in the way of us achieving a strong sense of belonging in Waterloo Region, especially for children and youth?

- Limited Access to Youth-Driven Activities and Resources
- Systemic Social Barriers
- Not Fostering In-Person, Meaningful Connections
- Lack of Trust and Respect by Adults Towards Youth
- We Don't Prioritize Connecting to Build Relationships
- (Un)Intended Consequences of Inequity

Limited Access to Youth-Driven Activities and Resources

H

LIMITED ACCESS TO YOUTH-DRIVEN ACTIVITIES AND RESOURCES

- Not a kid-friendly society (lack of safe spaces for kids to play, hangout in the community)
- Lack of access to meaningful activities/resources
- Transportation isn't affordable
- Lack of diversity and inclusiveness (e.g. in leadership, front line services)
- Not having a voice for choice
- Not understanding youth as capable and competent
- Youth-driven activities aren't integrated
- Lack of knowledge of and access to resources
- Notion of success in school (kids can't fail)

Systemic Social Barriers

SYSTEMIC SOCIAL BARRIERS

- The 'ISMs—it's real (racism, ageism, sexism, etc.)
- Negative social media
- Lack of shared understanding, definition for sense of belonging
- Economic inequality
- Mental health and wellness
- Lack of data that tells us how different populations are faring

Not Fostering In-Person, Meaningful Connections

I

NOT FOSTERING IN-PERSON, MEANINGFUL CONNECTIONS

- Few opportunities for building meaningful relationships
- Lack of opportunity for intergenerational interaction
- It takes a power outage to draw people out
- Concerns about physical safety
- Concept that technology will solve the lack of healthy relationships
- Lack of meaningful mentorship
- Language barriers
- Lack of time outside in spaces that are safe for kids
- Lack of evidence showing how sense of belonging contributes to a better future

Lack of Trust and Respect by Adults Towards Youth

E

LACK OF TRUST AND RESPECT BY ADULTS TOWARDS YOUTH

- Youth voices not being heard
- Showing disrespect by ignoring us (e.g. neighbours)
- Stigma—fear of talking with youth
- Prejudice

We Don't Prioritize Connecting to Build Relationships

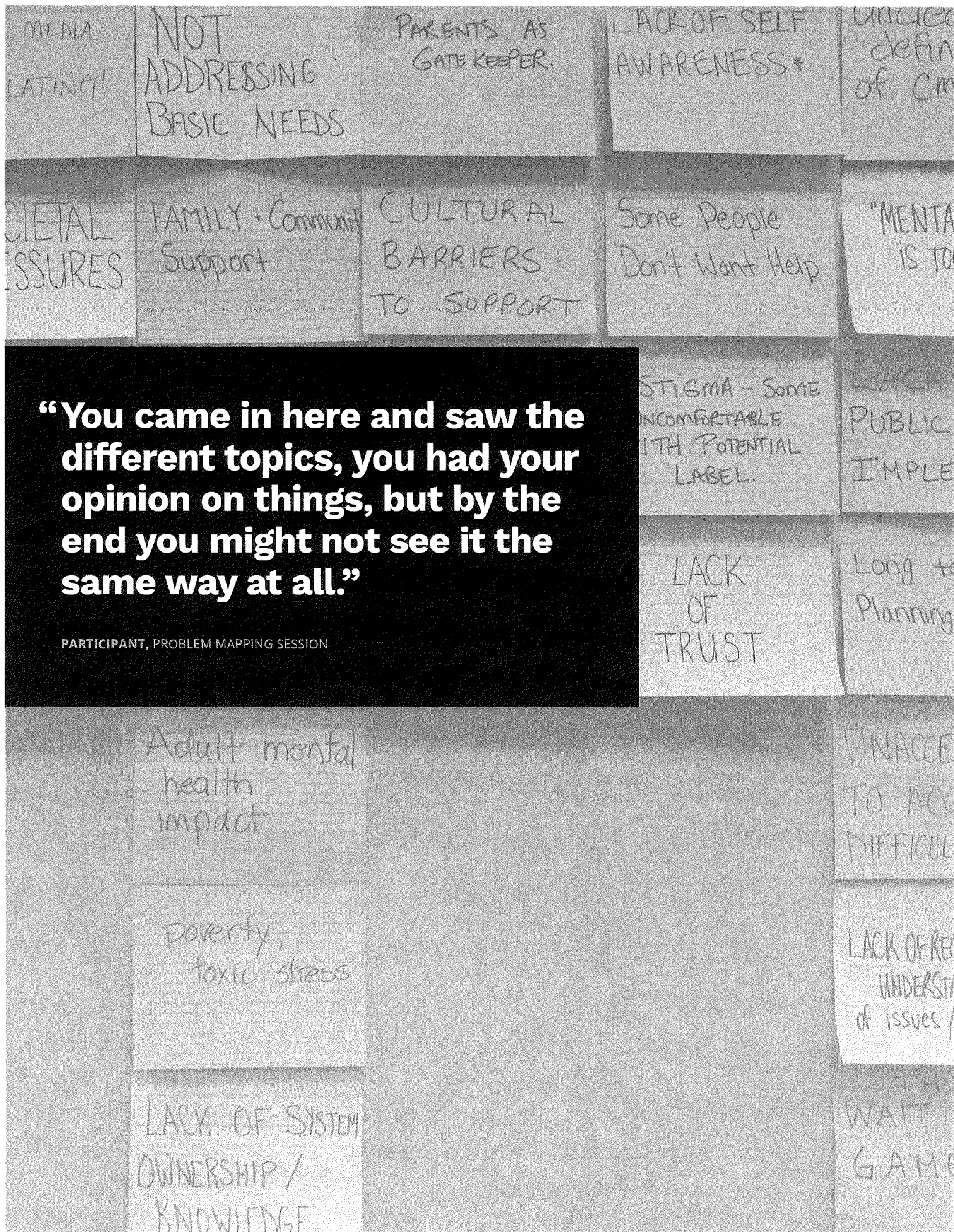
WE DON'T PRIORITIZE CONNECTING TO BUILD RELATIONSHIPS

- Lack of attention to family belonging
- Newness/unfamiliarity with Region (community, services)
- Time crunch (as barrier to relationship building)
- Fear of trying things out
- Lack of willingness to meet new people
- Not connecting with people who are new to the community (how and when)
- Transience of students (e.g. college, university)
- Lack of opportunity for development (skills, social skills)

(Un)Intended Consequences of Inequity

(UN)INTENDED CONSEQUENCES OF INEQUITY

- Inequality between schools/boards
- Not being able to participate in school events, field trips, etc. for financial, religious, cultural or other reasons
- Discrimination
- Poverty (e.g. can't afford pizza day, so not part of group)



“You came in here and saw the different topics, you had your opinion on things, but by the end you might not see it the same way at all.”

PARTICIPANT, PROBLEM MAPPING SESSION

Shared Themes

"Looking at what other groups have done, I think there's a lot of connectedness."

Adult Participant, CYPT Problem Mapping Session

Many of the obstacles identified by participants in the Problem Mapping sessions were shared across more than one priority area. This might make it possible to move the needle in multiple areas by tackling one obstacle. In reflecting at the end of the day, participants were encouraged to look for common themes.

The connections they identified between the six priority areas included:

- The need for relationships and meaningful connections with people
- The need to hear youth voices and include youth input
- The need to address knowledge gaps—for both the general public and policy makers
- The need to start building skills and addressing needs in early childhood.
- The need to overcome service and system challenges around coordination, waitlists, prevention, communication and planning
- The need for a shift in societal values—to prioritizing women's and children's issues
- The need to acknowledge, reduce and overcome social exclusion—the way people are impacted by 'isms (racism, ageism), poverty, trauma, etc.

What were themes you saw come up across the priority areas?

COMMENTS FROM PARTICIPANTS

"Early childhood education kept coming up...if you're not developing these things while you're still young, in the future you're not going to have those necessary skills...Although it will take a long time to integrate those things, if we start now, in the future it could have a big impact."

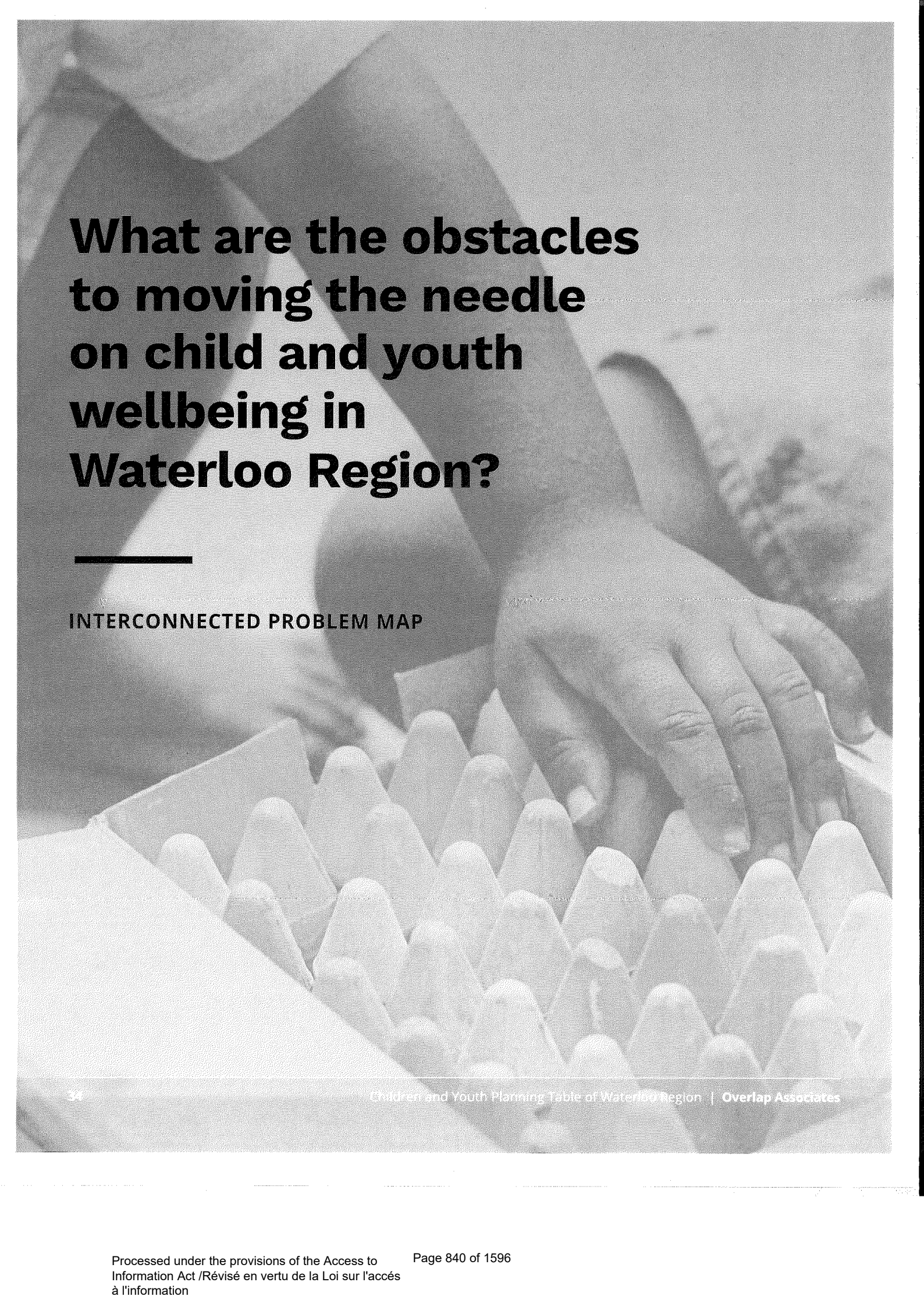
"Face to face relationships. Engaging with other people one on one."

"Differences and supporting those differences. These topics aren't just one size fits all. It's about respecting individuals as individuals."

"Sense of belonging comes up across (six priority areas)...In the context of meaningful relationships, it's finding its way across the board."

"System level issues, and a lot of education and knowledge barriers that need to be addressed across all six."

"Policy issues and societal values. The notion that policy plays an important role in shaping societal values, and policy can play a role in shifting the values that we've got today."



What are the obstacles to moving the needle on child and youth wellbeing in Waterloo Region?

INTERCONNECTED PROBLEM MAP

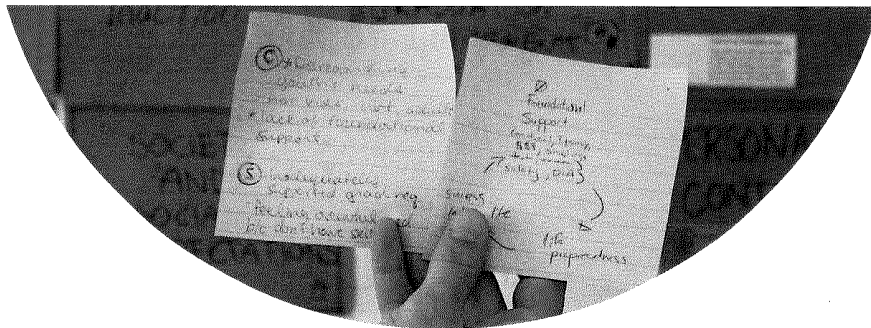
Understanding the Interconnected Problem Map

What is the interconnected problem map?

The interconnected problem map visually shows the connections between obstacles in the six priority areas. Obstacles from each area were clustered together to create eight overarching obstacles—many of which touch multiple priority areas. In addition to this map, a deep dive into each overarching obstacle outlines possible causes and symptoms of that obstacle—including supporting information from local engagement with children, youth and families.

The interconnected problem map highlights the problems we might work on to move the needle on child and youth wellbeing in multiple priority areas. It gives a common framework for discussing where different services and initiatives may want to focus their efforts. Once validated with children and youth, it will serve as a foundation for all child and youth-focused work in the Region by identifying and describing problems that will have the biggest impact, if addressed.

Problem maps are dynamic, living documents. They should be looked at as perpetual drafts, capturing the best understanding we have of the problem at a given point in time. With this mindset, they can always be iterated on as our understanding of the problem shifts, as new challenges emerge, and as progress is made.



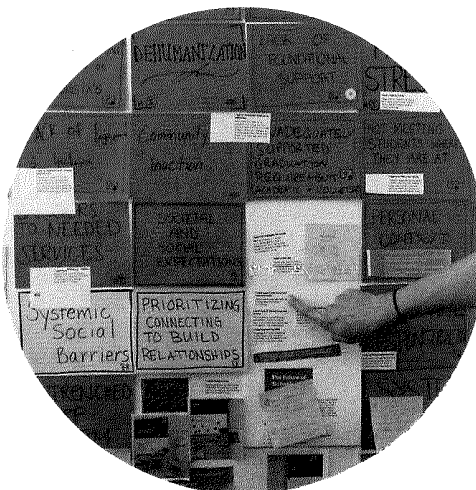
How was this map created?

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Once finished building clusters, the Overlap team examined the results from previous engagement with local children and youth. Themes, needs and ideas from these engagements were layered on top of the synthesized output from the Problem Mapping Session. This information is presented in the section "Support from Previous Engagement with Children and Youth".

The Overlap team then proposed possible causes and symptoms. Using the input from the Problem Mapping Session and local engagement, the Overlap team hypothesized issues that contributed to the obstacle (possible causes) and

issues that resulted from the obstacle (possible symptoms). For the purpose of this report, symptoms can be understood as indicators or signs the problem exists while causes are the underlying reasons why the problem exists. This information is presented in the section "Possible Causes and Symptoms". These are preliminary hypotheses which will benefit from further validation with children and youth.



Which engagement results were referenced?

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Engagement with the Canadian Mental Health Association of Waterloo Wellington, on needs of children, youth and families dealing with mental health issues

- Insights Report for Moving on Mental Health Wellington Dufferin, 2016

This project aimed to understand the specific experiences of children, youth and families with mental health needs in the Wellington Dufferin area, which is adjacent to Waterloo Region. Engagement included children, youth, young adults, parents and service providers and used methods such as ethnography, stakeholder labs, interviews, and surveys.

Families who participated represented a wide range of experiences, including diagnoses and needs related to mental health, developmental disabilities, learning disabilities, substance use, concurrent disorders, and dual diagnosis. The themes and stories that emerged were incorporated into the interconnected problem map.

Street Teams engagement with One Youth, on being a kid in Canada

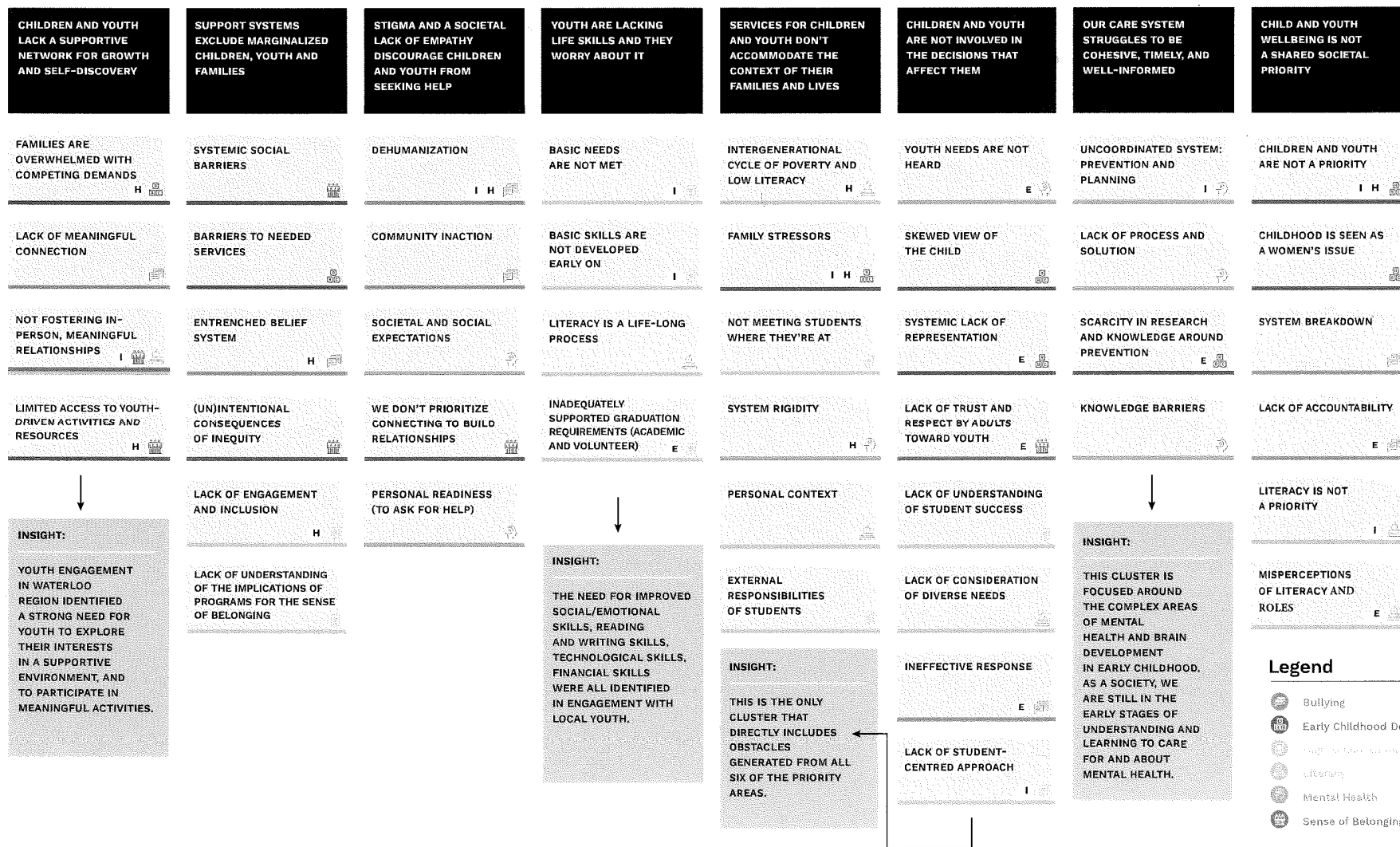
- Insights Report on One Youth Street Teams Survey on Childhood, 2017

Street Teams gathered people's perspectives on the experience of being a kid in Canada and their hopes for future generations. The Street Teams engaged over 300 people across Canada. 20% of respondents were from Waterloo Region. The themes and needs that emerged were incorporated into the interconnected problem map.

In addition, Overlappers were able to draw on more general experiences working in the problem space to inform their understanding—this includes work with the Early Literacy Alliance of Waterloo Region in the area of early childhood development, engagement with parents to inform the Parenting Now initiative with KW Counselling, community engagement with youth groups for local library strategic plans, engagement with KidsAbility stakeholders for a strategic plan, and future-focused Change Network sessions as part of work with UNICEF Canada.



Interconnected Problem Map





Deep Dive into Each Obstacle

Children and youth lack a supportive network for growth and self-discovery

**CHILDREN AND YOUTH
LACK A SUPPORTIVE
NETWORK FOR GROWTH
AND SELF-DISCOVERY**

**FAMILIES ARE
OVERWHELMED WITH
COMPETING DEMANDS**



**LACK OF MEANINGFUL
CONNECTION**



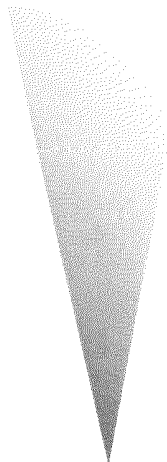
**NOT FOSTERING IN-
PERSON, MEANINGFUL
RELATIONSHIPS**



**LIMITED ACCESS TO YOUTH-
DRIVEN ACTIVITIES AND
RESOURCES**



Causes



- Families are overwhelmed with competing demands (technology, busyness). Communities are organized in ways that stifle interaction and provide few spaces for youth
- Children and youth lack meaningful Relationships, mentors and role models
- Youth have limited access to interesting activities and resources
- Children and youth experience boredom, loneliness, low sense of value and lack of purpose

Symptoms

Support from Previous Engagement with Children, Youth and Families

- Inclusion and Belonging: opportunities for children and youth to be part of a community and express themselves—theme identified through One Youth Street Teams engagement
- I need supportive adults in my life—need identified through One Youth Street Teams engagement
- I need opportunities to learn and try new things—need identified through One Youth Street Teams engagement
- A skate park for youth—idea generated during Rural Realities engagement, in response to lack of spaces to spend time with friends
- “We need a bus”—in reaction to the transportation theme during Rural Realities engagement
- “No free activities to meet people in the community”—youth participant during Rural Realities engagement
- I need access to resources and opportunities—need identified through One Youth Street Teams engagement
- I need to play outside—need identified through One Youth Street Teams engagement
- Healthy relationships: people to make children and youth feel special, quality time with friends and family, parents less overwhelmed—theme identified through One Youth Street Teams engagement

Support systems exclude marginalized children, youth and families

SUPPORT SYSTEMS
EXCLUDE MARGINALIZED
CHILDREN, YOUTH AND
FAMILIES

SYSTEMIC SOCIAL
BARRIERS



BARRIERS TO NEEDED
SERVICES



ENTRENCHED BELIEF
SYSTEM



(UN)INTENTIONAL
CONSEQUENCES
OF INEQUITY



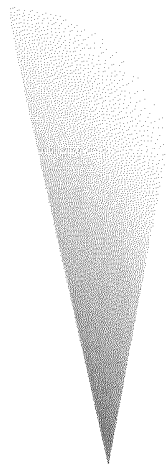
LACK OF ENGAGEMENT
AND INCLUSION



LACK OF UNDERSTANDING
OF THE IMPLICATIONS OF
PROGRAMS FOR THE SENSE
OF BELONGING



Causes



- Discrimination is institutionalized over time, groups are systematically excluded
- People have entrenched beliefs, people act those out with discriminatory behaviours ("ISM's")
- Groups have unequal outcomes

Symptoms

Support from Previous Engagement with Children, Youth and Families

- I need an inclusive world without discrimination—need identified through One Youth Street Teams engagement
- I need diverse role models—need identified through One Youth Street Teams engagement

Stigma and a societal lack of empathy discourage children and youth from seeking help

STIGMA AND A SOCIETAL LACK OF EMPATHY DISCOURAGE CHILDREN AND YOUTH FROM SEEKING HELP

DEHUMANIZATION



COMMUNITY INACTION



SOCIETAL AND SOCIAL EXPECTATIONS



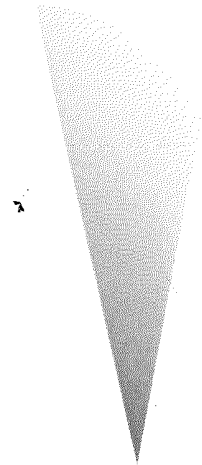
WE DON'T PRIORITIZE CONNECTING TO BUILD RELATIONSHIPS



PERSONAL READINESS (TO ASK FOR HELP)



Causes



- We don't prioritize connectedness. Technology and social media distance us
- We lack empathy for each other, we distance ourselves from the experience of others
- We don't act when people need support, we stigmatize people who need help
- People don't ask for help and suffer alone

Symptoms

Support from Previous Engagement with Children, Youth and Families

- Impacts of Stigma, including denying a mental health issue because it feels so scary, not asking for help to avoid judgment, and not asking for help as a parent because of the risk of losing a child—theme from Moving on Mental Health Insights Report
- Online anonymous mental and sexual health service—idea generated during Rural Realities engagement, in response to lack of anonymity and fear of judgement by parents or peers
- Not accessing sexual health care due to stigma and fear of judgement—theme from Rural Realities engagement
- Not going to counselling because in a small town someone might find out—in response to mental health theme during Rural Realities engagement
- I need bullying to stop—need identified through One Youth Street Teams engagement

Youth are lacking life skills and they worry about it

**YOUTH ARE LACKING
LIFE SKILLS AND THEY
WORRY ABOUT IT**

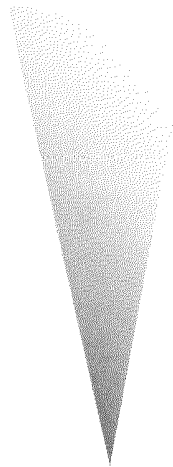
**BASIC NEEDS
ARE NOT MET**

**BASIC SKILLS ARE
NOT DEVELOPED
EARLY ON**

**LITERACY IS A LIFE-LONG
PROCESS**

**INADEQUATELY
SUPPORTED GRADUATION
REQUIREMENTS (ACADEMIC
AND VOLUNTEER)**

Causes



- Skills needed today are different than in the past (technological skills, social/emotional skills) and parents and schools aren't equipped to teach
- Youth aren't learning necessary life skills
- Some youth recognize they lack skills and feel stressed and overwhelmed. Others don't recognize until their shortcomings are made explicit
- Youth struggle with adulthood, because they aren't prepared

Symptoms

Support from Previous Engagement with Children, Youth and Families

- I need support with social and emotional skills—need identified through One Youth Street Teams engagement
- I need help managing life events—need identified through One Youth Street Teams engagement
- I need help learning skills—need identified through One Youth Street Teams engagement
- I need to be prepared for my career—need identified through One Youth Street Teams engagement
- I need support with dealing with drugs and alcohol—need identified through One Youth Street Teams engagement
- “This is not taught in school”, “We have the opportunity to get a job at a young age, but we aren't taught how to (e.g.) balance a cheque”—in response to the theme of managing money during Rural Realities engagement
- The Future of Technology: being prepared to use future technology and having a balanced consumption of technology—theme identified through One Youth Street Teams engagement
- “Having solid speech and language skills. Being able Understanding what the teacher and the other children are saying”—comment from youth respondent in One Youth Street Teams engagement

Services for children and youth don't accommodate the context of their families and lives

**SERVICES FOR CHILDREN
AND YOUTH DON'T
ACCOMMODATE THE
CONTEXT OF THEIR
FAMILIES AND LIVES**

**INTERGENERATIONAL
CYCLE OF POVERTY AND
LOW LITERACY**



FAMILY STRESSORS



**NOT MEETING STUDENTS
WHERE THEY'RE AT**



SYSTEM RIGIDITY



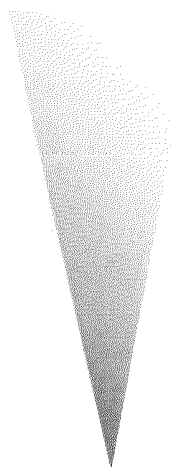
PERSONAL CONTEXT



**EXTERNAL
RESPONSIBILITIES
OF STUDENTS**



Causes



- Many children, youth and families experience pressures like poverty, low literacy, working multiple jobs, being a youth and also a parent, and inadequate housing
- Systems involving children and youth are rigid and assume certain parental supports
- Children/youth and families can't access services
- Needs go unmet and the cycle continues in the next generation

Symptoms

Support from Previous Engagement with Children, Youth and Families

- I need my basic needs to be met—need identified through One Youth Street Teams engagement
- I need to be financially secure—need identified through One Youth Street Teams engagement
- I need a healthy family—need identified through One Youth Street Teams engagement
- Services models don't match the complexity of real life—subtheme from Moving on Mental Health Insights Report
- Needs of a child are nested within the needs of a complex family—theme from Moving on Mental Health Insights Report
- Safety and basic needs: finances for shelter, food, clothing and recreation, a safe environment, supportive authority figures—theme identified through One Youth Street Teams engagement
- "You need a car to get to work, but a job to pay for a car"—in response to the theme of Money during Rural Realities engagement

Children and youth are not involved in the decisions that affect them

CHILDREN AND YOUTH ARE NOT INVOLVED IN THE DECISIONS THAT AFFECT THEM

YOUTH NEEDS ARE NOT HEARD



SKEWED VIEW OF THE CHILD



SYSTEMIC LACK OF REPRESENTATION



LACK OF TRUST AND RESPECT BY ADULTS TOWARD YOUTH



LACK OF UNDERSTANDING OF STUDENT SUCCESS



LACK OF CONSIDERATION OF DIVERSE NEEDS



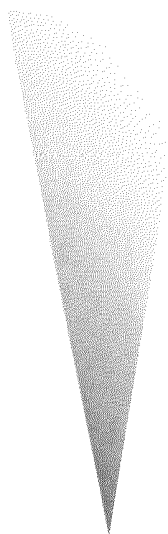
INEFFECTIVE RESPONSE



LACK OF STUDENT-CENTRED APPROACH



Causes



- Adults don't acknowledge the capacity of children and youth and the value of their contributions
- Adults don't know how to involve youth in decision-making and designing solutions
- There is a systemic lack of representation of children and youth's interests
- Children and youth aren't involved in decisions that affect them, and youth needs are not heard
- Systems don't consider the needs of children and youth
- Learning isn't student-centred and reflects a lack of understanding of student success
- Responses to bullying are ineffective

Symptoms

Support from Previous Engagement with Children, Youth and Families

- I need to be respected and heard—need identified through One Youth Street Teams engagement
- I need school to be better (material taught in class, program structure, placement of schools)—need identified through One Youth Street Teams engagement
- Freedom and independence: feeling that children are not viewed as individuals or taken seriously, and that opportunities for independence are limited by adults' rules and controls—theme identified through One Youth Street Teams engagement
- "I like the fact that we get an input in the community. It doesn't happen often." comment from youth respondent reflecting on Rural Realities engagement
- "I'm not heard/listened to because I'm young"—comment on Feeling Heard theme during Rural Realities engagement

Our care system struggles to be cohesive, timely, and well-informed

**OUR CARE SYSTEM
STRUGGLES TO BE
COHESIVE, TIMELY, AND
WELL-INFORMED**

**UNCOORDINATED SYSTEM:
PREVENTION AND
PLANNING**



**LACK OF PROCESS AND
SOLUTION**



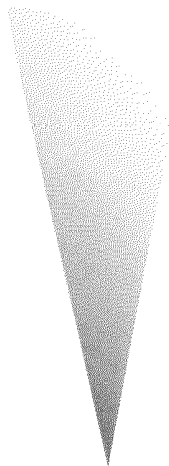
**SCARCITY IN RESEARCH
AND KNOWLEDGE AROUND
PREVENTION**



KNOWLEDGE BARRIERS



Causes



- People are complex—especially our brains
- It is hard to understand and successfully intervene in at-risk brain development and poor mental health. Knowledge, process and best practices are limited
- Formal care systems are overwhelmed by complexity and become complicated as well
- People face long wait times for care, people have trouble navigating the system, service providers feel burnt out, and prevention is rare

Symptoms

Support from Previous Engagement with Children, Youth and Families

- A system built to manage crisis is not aligned with the needs of children and families—theme from Moving on Mental Health Insights Report
- “There’s a big grey area in knowing where to go for the right service. There are overlaps in what service providers offer”—comment from a service provider participating in Moving on Mental Health engagement
- I need to understand and manage mental health—need identified through One Youth Street Teams engagement
- “Too many people don’t understand the severity of anxiety/depression. We need to be heard”—comment in response to theme of Mental Health during Rural Realities engagement

Child and youth wellbeing is not a shared societal priority

CHILD AND YOUTH WELLBEING IS NOT A SHARED SOCIETAL PRIORITY

CHILDREN AND YOUTH ARE NOT A PRIORITY

I H P
D C

CHILDHOOD IS SEEN AS A WOMEN'S ISSUE

G
D C

SYSTEM BREAKDOWN

E
D C

TURNING A BLIND EYE

E
D C

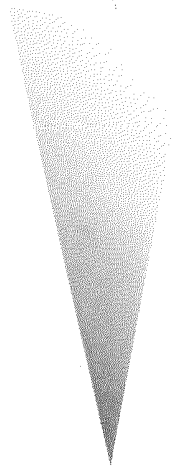
LITERACY IS NOT A PRIORITY

I
D C

MISPERCEPTIONS OF LITERACY

E
D C

Causes



- Child and youth wellbeing issues are experienced most by people who don't hold power in society
- Child and youth wellbeing is not a top priority
- It's unclear which one entity is most responsible or accountable (parents, schools, government, other services, etc.) and most entities are balancing multiple priorities
- Policies and systems don't reflect the needs and wants of children and youth
- Children grow up with unidentified and unmet needs

Symptoms

Support from Previous Engagement with Children, Youth and Families

- I need the government to care more about kids—need identified through One Youth Street Teams engagement
- Schools feel like connectors and experts in services, but aren't designed for this—subtheme in Moving on Mental Health Insights Report

What happens next?

These interconnected obstacles point to possible leverage points and connections between the six priority areas of the Children and Youth Planning Table. The map contains our best understanding of the problems at this point, which will benefit from ongoing validation with local children, youth, families and service providers. The next steps for evolving this interconnected problem map and using it to tackle challenges for child and youth wellbeing are:

Clarifying language and developing a common understanding

Before reaching out to children and youth, it's important for the project team to seek clarity on the elements of the problem map (the interconnected obstacles framework, possible symptoms, and possible root causes). The goal is not to validate or invalidate, but to make sure any confusing language is identified and suggest revisions. Once there is shared understanding of the various facets of the problem map, each obstacle cluster can be summarized in plain language, and a plan developed for communicating with children and youth about these issues.

Creating data-informed problem statements

The next step is to re-write the obstacle titles as data-informed problem statements. This involves imagining what we might expect to happen if the obstacle were removed. Imagining what progress might look like helps identify possible indicators that could be used to measure progress on solving that particular obstacle.

Validating by engaging with children and youth

Both clear language and data-informed problem statements will be instrumental in validating the obstacles, possible symptoms and possible causes by conducting ongoing engagement work—asking children and youth to contribute their perspectives to the problem map and identify any gaps or misunderstandings.

**The Facilitation and Session Output have been
developed collaboratively with Overlap Associates.**

OVERLAP ASSOCIATES INC.

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Kitchener, Ontario N2G 1B9

**Better is
absolutely
possible.**

overlapassociates.com

What are the obstacles to moving the needle on child and youth wellbeing in Waterloo Region?

INTERCONNECTED PROBLEM MAP

**Overlap
Associates**



**Children and Youth
Planning Table**
of Waterloo Region

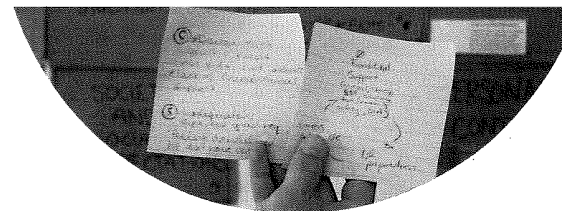
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Engagement with the Canadian Mental Health Association of Waterloo Wellington, on needs of children, youth and families dealing with mental health issues

- Insights Report for Moving on Mental Health Wellington Dufferin, 2016

This project aimed to understand the specific experiences of children, youth and families with mental health needs in the Wellington Dufferin area, which is adjacent to Waterloo Region. Engagement included children, youth, young adults, parents and service providers and used methods such as ethnography, stakeholder labs, interviews, and surveys.

Families who participated represented a wide range of experiences, including diagnoses and needs related to mental health, developmental disabilities, learning disabilities, substance use, concurrent disorders, and dual diagnosis. The themes and stories that emerged were incorporated into the interconnected problem map.

Street Teams engagement with One Youth, on being a kid in Canada

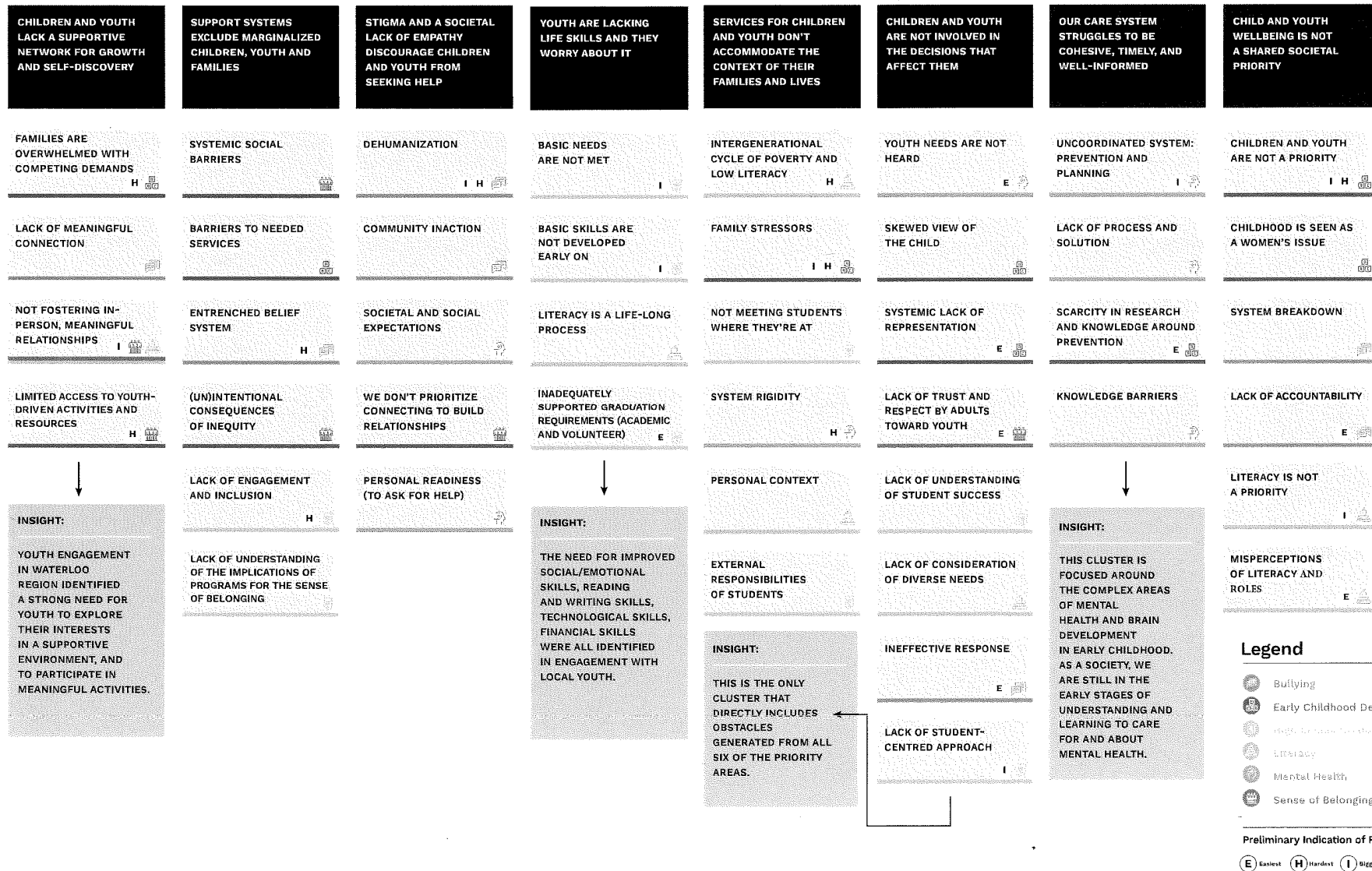
- Insights Report on One Youth Street Teams Survey on Childhood, 2017

Street Teams gathered people's perspectives on the experience of being a kid in Canada and their hopes for future generations. The Street Teams engaged over 300 people across Canada. 20% of respondents were from Waterloo Region. The themes and needs that emerged were incorporated into the interconnected problem map.

In addition, Overlappers were able to draw on more general experiences working in the problem space to inform their understanding—this includes work with the Early Literacy Alliance of Waterloo Region in the area of early childhood development, engagement with parents to inform the Parenting Now initiative with KW Counselling, community engagement with youth groups for local library strategic plans, engagement with KidsAbility stakeholders for a strategic plan, and future-focused Change Network sessions as part of work with UNICEF Canada.



Interconnected Problem Map



A black and white photograph of a young child, possibly a girl, wearing a light-colored jacket with a large pocket. The child is reaching out with both hands towards a small globe of the Earth. The background is out of focus, showing trees and bubbles floating in the air. The text "Deep Dive into Each Obstacle" is overlaid on the left side of the image.

Deep Dive into Each Obstacle

Children and youth lack a supportive network for growth and self-discovery

CHILDREN AND YOUTH LACK A SUPPORTIVE NETWORK FOR GROWTH AND SELF-DISCOVERY

FAMILIES ARE OVERWHELMED WITH COMPETING DEMANDS

LACK OF MEANINGFUL CONNECTION

NOT FOSTERING IN-PERSON, MEANINGFUL RELATIONSHIPS

LIMITED ACCESS TO YOUTH-DRIVEN ACTIVITIES AND RESOURCES

Causes

- Families are overwhelmed with competing demands (technology, busyness)
Communities are organized in ways that stifle interaction and provide few spaces for youth
- Children and youth lack meaningful Relationships, mentors and role models
- Youth have limited access to interesting activities and resources
- Children and youth experience boredom, loneliness, low sense of value and lack of purpose

Symptoms

Support from Previous Engagement with Children, Youth and Families

- Inclusion and Belonging: opportunities for children and youth to be part of a community and express themselves—theme identified through One Youth Street Teams engagement
- I need supportive adults in my life—need identified through One Youth Street Teams engagement
- I need opportunities to learn and try new things—need identified through One Youth Street Teams engagement
- A skate park for youth—idea generated during Rural Realities engagement, in response to lack of spaces to spend time with friends
- “We need a bus”—in reaction to the transportation theme during Rural Realities engagement
- “No free activities to meet people in the community”—youth participant during Rural Realities engagement
- I need access to resources and opportunities—need identified through One Youth Street Teams engagement
- I need to play outside—need identified through One Youth Street Teams engagement
- Healthy relationships: people to make children and youth feel special, quality time with friends and family, parents less overwhelmed—theme identified through One Youth Street Teams engagement

Support systems exclude marginalized children, youth and families

SUPPORT SYSTEMS EXCLUDE MARGINALIZED CHILDREN, YOUTH AND FAMILIES

SYSTEMIC SOCIAL BARRIERS

BARRIERS TO NEEDED SERVICES

ENTRENCHED BELIEF SYSTEM

(UN)INTENTIONAL CONSEQUENCES OF INEQUITY

LACK OF ENGAGEMENT AND INCLUSION

LACK OF UNDERSTANDING OF THE IMPLICATIONS OF PROGRAMS FOR THE SENSE OF BELONGING

Causes

- Discrimination is institutionalized over time, groups are systematically excluded
- People have entrenched beliefs, people act those out with discriminatory behaviours (“ISM’s”)
- Groups have unequal outcomes

Symptoms

Support from Previous Engagement with Children, Youth and Families

- I need an inclusive world without discrimination—need identified through One Youth Street Teams engagement
- I need diverse role models—need identified through One Youth Street Teams engagement

Stigma and a societal lack of empathy discourage children and youth from seeking help

STIGMA AND A SOCIETAL LACK OF EMPATHY DISCOURAGE CHILDREN AND YOUTH FROM SEEKING HELP

DEHUMANIZATION

I H

COMMUNITY INACTION

SOCIETAL AND SOCIAL EXPECTATIONS

WE DON'T PRIORITIZE CONNECTING TO BUILD RELATIONSHIPS

PERSONAL READINESS (TO ASK FOR HELP)

Causes

- We don't prioritize connectedness. Technology and social media distance us
- We lack empathy for each other, we distance ourselves from the experience of others
- We don't act when people need support, we stigmatize people who need help
- People don't ask for help and suffer alone

Symptoms

Support from Previous Engagement with Children, Youth and Families

- Impacts of Stigma, including denying a mental health issue because it feels so scary, not asking for help to avoid judgment, and not asking for help as a parent because of the risk of losing a child—theme from Moving on Mental Health Insights Report
- Online anonymous mental and sexual health service—idea generated during Rural Realities engagement, in response to lack of anonymity and fear of judgement by parents or peers
- Not accessing sexual health care due to stigma and fear of judgement—theme from Rural Realities engagement
- Not going to counselling because in a small town someone might find out—in response to mental health theme during Rural Realities engagement
- I need bullying to stop—need identified through One Youth Street Teams engagement

Youth are lacking life skills and they worry about it

YOUTH ARE LACKING LIFE SKILLS AND THEY WORRY ABOUT IT

BASIC NEEDS ARE NOT MET

BASIC SKILLS ARE NOT DEVELOPED EARLY ON

LITERACY IS A LIFE-LONG PROCESS

INADEQUATELY SUPPORTED GRADUATION REQUIREMENTS (ACADEMIC AND VOLUNTEER)

Causes

- Skills needed today are different than in the past (technological skills, social/emotional skills) and parents and schools aren't equipped to teach
- Youth aren't learning necessary life skills
- Some youth recognize they lack skills and feel stressed and overwhelmed. Others don't recognize until their shortcomings are made explicit
- Youth struggle with adulthood, because they aren't prepared

Symptoms

Support from Previous Engagement with Children, Youth and Families

- I need support with social and emotional skills—need identified through One Youth Street Teams engagement
- I need help managing life events—need identified through One Youth Street Teams engagement
- I need help learning skills—need identified through One Youth Street Teams engagement
- I need to be prepared for my career—need identified through One Youth Street Teams engagement
- I need support with dealing with drugs and alcohol—need identified through One Youth Street Teams engagement
- "This is not taught in school", "We have the opportunity to get a job at a young age, but we aren't taught how to (e.g.) balance a cheque"—in response to the theme of managing money during Rural Realities engagement
- The Future of Technology: being prepared to use future technology and having a balanced consumption of technology—theme identified through One Youth Street Teams engagement
- "Having solid speech and language skills. Being able Understanding what the teacher and the other children are saying"—comment from youth respondent in One Youth Street Teams engagement

Services for children and youth don't accommodate the context of their families and lives

SERVICES FOR CHILDREN AND YOUTH DON'T ACCOMMODATE THE CONTEXT OF THEIR FAMILIES AND LIVES

INTERGENERATIONAL CYCLE OF POVERTY AND LOW LITERACY

FAMILY STRESSORS

NOT MEETING STUDENTS WHERE THEY'RE AT

SYSTEM RIGIDITY

PERSONAL CONTEXT

EXTERNAL RESPONSIBILITIES OF STUDENTS

Causes

- Many children, youth and families experience pressures like poverty, low literacy, working multiple jobs, being a youth and also a parent, and inadequate housing
- Systems involving children and youth are rigid and assume certain parental supports
- Children/youth and families can't access services
- Needs go unmet and the cycle continues in the next generation

Symptoms

Support from Previous Engagement with Children, Youth and Families

- I need my basic needs to be met—need identified through One Youth Street Teams engagement
- I need to be financially secure—need identified through One Youth Street Teams engagement
- I need a healthy family—need identified through One Youth Street Teams engagement
- Services models don't match the complexity of real life—subtheme from Moving on Mental Health Insights Report
- Needs of a child are nested within the needs of a complex family—theme from Moving on Mental Health Insights Report
- Safety and basic needs: finances for shelter, food, clothing and recreation, a safe environment, supportive authority figures—theme identified through One Youth Street Teams engagement
- "You need a car to get to work, but a job to pay for a car"—in response to the theme of Money during Rural Realities engagement

Children and youth are not involved in the decisions that affect them

CHILDREN AND YOUTH ARE NOT INVOLVED IN THE DECISIONS THAT AFFECT THEM

YOUTH NEEDS ARE NOT HEARD

SKWEVED VIEW OF THE CHILD

SYSTEMIC LACK OF REPRESENTATION

LACK OF TRUST AND RESPECT BY ADULTS TOWARD YOUTH

LACK OF UNDERSTANDING OF STUDENT SUCCESS

LACK OF CONSIDERATION OF DIVERSE NEEDS

INEFFECTIVE RESPONSE

LACK OF STUDENT-CENTRED APPROACH

Causes

- Adults don't acknowledge the capacity of children and youth and the value of their contributions
- Adults don't know how to involve youth in decision-making and designing solutions
- There is a systemic lack of representation of children and youth's interests
- Children and youth aren't involved in decisions that affect them, and youth needs are not heard
- Systems don't consider the needs of children and youth
- Learning isn't student-centred and reflects a lack of understanding of student success
- Responses to bullying are ineffective

Symptoms

Support from Previous Engagement with Children, Youth and Families

- I need to be respected and heard—need identified through One Youth Street Teams engagement
- I need school to be better (material taught in class, program structure, placement of schools)—need identified through One Youth Street Teams engagement
- Freedom and independence: feeling that children are not viewed as individuals or taken seriously, and that opportunities for independence are limited by adults' rules and controls—theme identified through One Youth Street Teams engagement
- "I like the fact that we get an input in the community. It doesn't happen often." comment from youth respondent reflecting on Rural Realities engagement
- "I'm not heard/listened to because I'm young"—comment on Feeling Heard theme during Rural Realities engagement

Our care system struggles to be cohesive, timely, and well-informed

OUR CARE SYSTEM STRUGGLES TO BE COHESIVE, TIMELY, AND WELL-INFORMED

UNCOORDINATED SYSTEM: PREVENTION AND PLANNING

LACK OF PROCESS AND SOLUTION

SCARCITY IN RESEARCH AND KNOWLEDGE AROUND PREVENTION

KNOWLEDGE BARRIERS

Causes

- People are complex—especially our brains
- It is hard to understand and successfully intervene in at-risk brain development and poor mental health. Knowledge, process and best practices are limited
- Formal care systems are overwhelmed by complexity and become complicated as well
- People face long wait times for care, people have trouble navigating the system, service providers feel burnt out, and prevention is rare

Symptoms

Support from Previous Engagement with Children, Youth and Families

- A system built to manage crisis is not aligned with the needs of children and families—theme from Moving on Mental Health Insights Report
- “There’s a big grey area in knowing where to go for the right service. There are overlaps in what service providers offer”—comment from a service provider participating in Moving on Mental Health engagement
- I need to understand and manage mental health—need identified through One Youth Street Teams engagement
- “Too many people don’t understand the severity of anxiety/depression. We need to be heard”—comment in response to theme of Mental Health during Rural Realities engagement

Child and youth wellbeing is not a shared societal priority

CHILD AND YOUTH WELLBEING IS NOT A SHARED SOCIETAL PRIORITY

CHILDREN AND YOUTH ARE NOT A PRIORITY

CHILDHOOD IS SEEN AS A WOMEN’S ISSUE

SYSTEM BREAKDOWN

LACK OF ACCOUNTABILITY

LITERACY IS NOT A PRIORITY

MISPERCEPTIONS OF LITERACY AND ROLES

Causes

- Child and youth wellbeing issues are experienced most by people who don’t hold power in society
- Child and youth wellbeing is not a top priority
- It’s unclear which one entity is most responsible or accountable (parents, schools, government, other services, etc.) and most entities are balancing multiple priorities
- Policies and systems don’t reflect the needs and wants of children and youth
- Children grow up with unidentified and unmet needs

Symptoms

Support from Previous Engagement with Children, Youth and Families

- I need the government to care more about kids—need identified through One Youth Street Teams engagement
- Schools feel like connectors and experts in services, but aren’t designed for this—subtheme in Moving on Mental Health Insights Report

What happens next?

These interconnected obstacles point to possible leverage points and connections between the six priority areas of the Children and Youth Planning Table. The map contains our best understanding of the problems at this point, which will benefit from ongoing validation with local children, youth, families and service providers. The next steps for evolving this interconnected problem map and using it to tackle challenges for child and youth wellbeing are:

Clarifying language and developing a common understanding

Before reaching out to children and youth, it's important for the project team to seek clarity on the elements of the problem map (the interconnected obstacles framework, possible symptoms, and possible root causes). The goal is not to validate or invalidate, but to make sure any confusing language is identified and suggest revisions. Once there is shared understanding of the various facets of the problem map, each obstacle cluster can be summarized in plain language, and a plan developed for communicating with children and youth about these issues.

Creating data-informed problem statements

The next step is to re-write the obstacle titles as data-informed problem statements. This involves imagining what we might expect to happen if the obstacle were removed. Imagining what progress might look like helps identify possible indicators that could be used to measure progress on solving that particular obstacle.

Validating by engaging with children and youth

Both clear language and data-informed problem statements will be instrumental in validating the obstacles, possible symptoms and possible causes by conducting ongoing engagement work—asking children and youth to contribute their perspectives to the problem map and identify any gaps or misunderstandings.

The Facilitation and Session Output have been developed collaboratively with Overlap Associates.

OVERLAP ASSOCIATES INC.

305 King Street West, Suite 1002,
Kitchener, Ontario N2G 1B9

**Better is
absolutely
possible.**

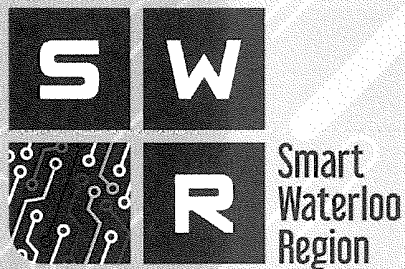
overlapassociates.com

10. Conversation Toolkit

Appendix A.

Conversation Toolkit

For Parents and Caring Adults



smartwr.ca

We will become the benchmark
community in Canada for child
and youth wellbeing.

We want Waterloo Region to be
the best community in Canada
for kids to grow up.

If you are a parent or a caring adult, or if you know someone who is, we need your help!

Smart Waterloo Region is using technology and data to improve the wellbeing of children and youth in our community.



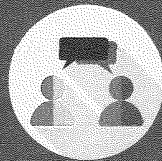
We hope you will use this Conversation Toolkit to share your ideas on how things could be better!

The toolkit will help you think about problems facing children and youth, imagine possible solutions, explore how technology can play a role, and envision a better future for young people in this community.

We have designed this toolkit to be flexible, so you can use it in lots of different ways:



Self-Reflection—Think about and answer these questions for yourself.



1-on-1 Conversations—Know a parent or caring adult? Ask them these questions.



Group Discussions—Bring a group together to talk about these questions—some people may be parents/caring adults, some may not.

Most conversations will be around 30 minutes—but take as much or as little time as you like.

Keep pen and paper handy to record some of the things you talk about. When you're done, share your responses with SmartWR (look for details on the last toolkit card!)

Problems and Possible Solutions

For this round of idea generation, we're focusing on a few key problems that children and youth have shared with us. We'd like to know how these problems affect you and the young people you care about.

These problems have been identified and shaped by working with young people. They are summarized here in a single sentence. There's more context on the back of the card.

Problem: Children and youth are not involved in choices about their lives and wellbeing.

Parents and caring adults also play an important role in making choices about a child's life and wellbeing. Sometimes, they're included, sometimes they're not.

- Are there ways you see the children you care about left out of decisions that affect them?
- As a parent or caring adult, are there times when you have felt left out of a decision about the wellbeing of a child you care about?
- Can you think of a time when someone did a good job of involving you or a child you care about in a decision?



How might we better involve young people and the adults that care about them in choices about their lives and wellbeing?

Want to know more about this problem?

Often, children and youth are not meaningfully involved in decisions that governments and social services make about their lives and well-being. As a result, young people's voices are not considered in decisions about community spaces, services and programs, curriculum, funding, and policy. When young people are not involved in these decisions, we miss out on their valuable input and may create solutions that are not best for them. We lack tools and processes that help young people feel informed, valued, and empowered to participate in decision-making that affects them.

Problem: Children and youth find it hard to get help because they are embarrassed or scared to ask an adult to help.

This is often the case for parents and caring adults too—it's embarrassing, scary and difficult to come forward and seek help when a child you care about is struggling.

-
- Do you have experience asking for help for a child you care about?
What was it like?
 - What was hard about it?
 - What went well?



What might make that experience of asking for help
(and others like it) better?

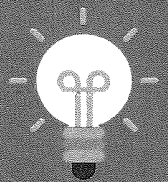
Want to know more about this problem?

Often, children and youth are not meaningfully involved in decisions that governments and social services make about their lives and well-being. As a result, young people's voices are not considered in decisions about community spaces, services and programs, curriculum, funding, and policy. When young people are not involved in these decisions, we miss out on their valuable input and may create solutions that are not best for them. We lack tools and processes that help young people feel informed, valued, and empowered to participate in decision-making that affects them.

Problem: Young people are lacking life skills and they worry about it.

Parents and caring adults play a role in helping young people develop life skills.

- What are you excited to teach the children you care about?
- What would you want help with?
- What was something you wish you had learned when you were growing up?
- Is there anything you worry the children you care about won't have a chance to learn?



How might we create more opportunities for children and youth to learn life skills?

Want to know more about this problem?

Young people feel that there are not enough opportunities to learn important life skills, including financial literacy and skills for civic engagement. They worry about facing these skill gaps as they become more independent and move into adulthood.

Children and youth need more time, space, and support to practice and explore life skills with supportive adults and peers. We also need to create opportunities for young people and adults to work together to identify what life skills are important.

As a parent or caring adult, what are some other problems you see in Waterloo Region that affect young people?

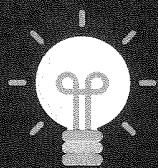
Solutions with Technology and Data

Part of Smart Waterloo Region is improving child and youth wellbeing in our Region by using data and technology.

Tech is everywhere these days—you probably use it often. Technology use can have good and bad consequences. For example, smart phones help us schedule, communicate, entertain and learn. They can also distract us or stress us out. We want to be very thoughtful about how we use technology in our solution.

Solutions with Technology and Data

- As a parent or caring adult, what are some examples of technology that you already use?
- What concerns do you have about using technology and data to develop solutions to issues affecting young people. What guidelines do you think should we follow?



What opportunities do you see to use technology and data to improve child and youth wellbeing in this community?

Solutions with Technology and Data

Bonus: Is someone in the conversation passionate about tech? Do concepts like “artificial intelligence”, “virtual reality”, and “internet of things” get you excited?

- How do you think emerging technologies will affect children and youth?
- What are some potential ways these innovations might benefit young people?
- What are some things you’re worried about?

What Better Looks Like

As a parent or caring adult, what are your hopes for the young people you care about?

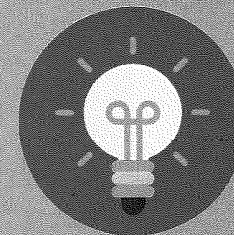


| What would help make this possible?



| What other ideas do you have for improving child and youth wellbeing in this community?

Share Ideas



What ideas did you or your group come up with? What problems did you identify?
What should we remember as we use technology and data to improve the wellbeing of children and youth in this community?

Please share a summary of the ideas and insights from your conversation with Smart Waterloo Region. You can also share any feedback you have on toolkit!

Here's how:

- Go to smartwr.com and post in our online forum
- Send an email to smartwr@regionofwaterloo.ca
- Post to twitter or Instagram using #SmartWR

Thank You!

Thank you for using this toolkit and sharing your thoughts! We will use your responses to guide the solutions we develop. Your ideas, along with ideas from children and youth, will be used in sessions with people who work in tech. Local tech talent will build out early versions of ideas. Those early versions will then go back out to the community for feedback and testing!

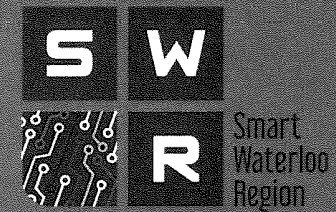
To stay involved in what happens next: follow @SmartWR on Twitter and Instagram or check back regularly at SmartWR.ca

Thanks!

SmartW/R

SmartW/R is a project of the
Waterloo Region Community Foundation

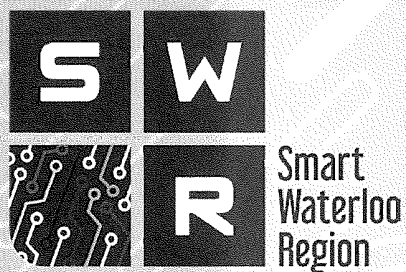
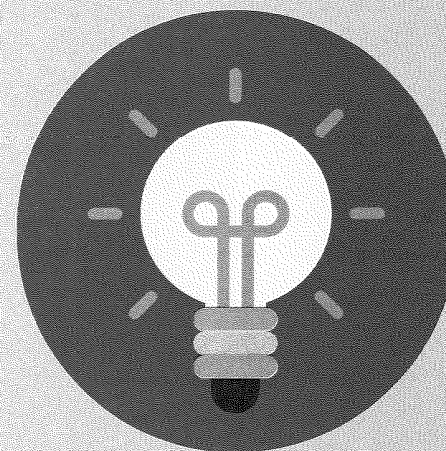
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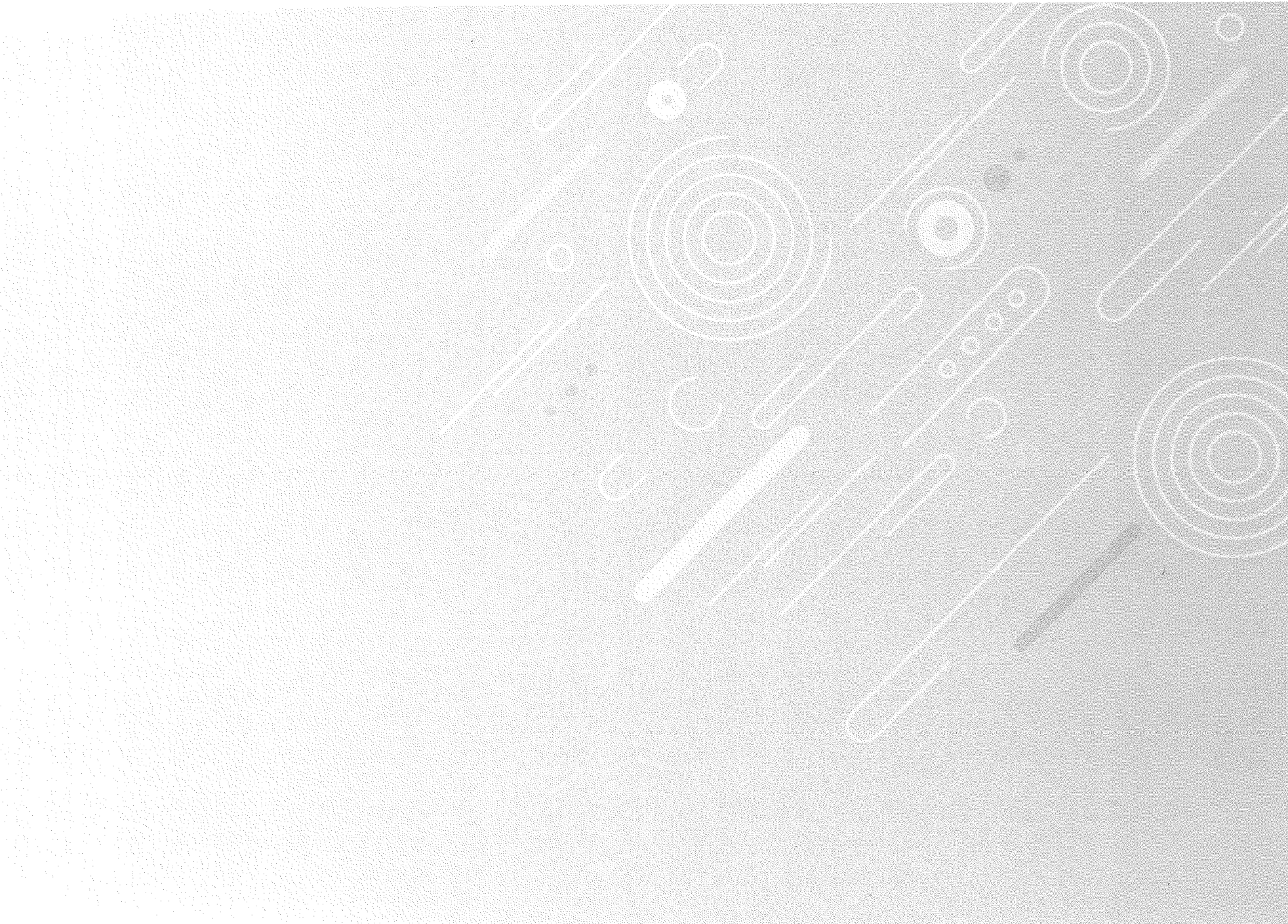
11. Idea Toolkit

Appendix A.

Idea Toolkit



smartwr.ca



We will become the benchmark community in Canada for child and youth well-being.

We want Waterloo Region to be the **best** place in Canada for kids to grow up.

STEP
1

If you work or spend time with children and youth, we need your help! You are invited to use this toolkit to host an “Idea Session” with young people. Here’s the 5-step process for doing this:

1. Read the purple Instructions Card and get prepared to run an Idea Session.
2. Pick one of the three red, orange or green Problem Cards that outline a challenge children and youth are facing in Waterloo Region. Read these to your group of children or youth.
3. Pick an activity from the Activity Card that matches the Problem Card you just read. These cards give you ideas for discussion and activity prompts to use with young people around the problem statements.
4. Share the ideas and insights from young people with the Smart Waterloo Region team, using the three methods outlined on the Share Card. Make sure you ask young people for their permission to share their ideas and stories.
5. Repeat with other Problem/Activity Cards, and other groups of young people.

How to host an Idea Session with children and youth

Coming up with new ideas is all about:

Starting solo - make sure everyone has a chance to think about their own ideas before sharing with the group.

Encouraging ourselves and others - at this stage, these ideas aren't right or wrong. Make space for all the silly, wacky, giant, and tiny ideas being shared.

Going for quantity over quality - we want as many ideas as possible to start. That means we want to spend less time refining ideas, and more time pushing ourselves to come up with lots of new ideas.

INSTRUCTIONS CARD

STEP

2

Materials or supplies you might use with children and youth to bring their ideas to life:

- Paper, sticky notes, construction paper
- Pens, pencils, coloured pencils and markers
- Tape, glue, scissors
- Pipe cleaners, popsicle sticks, stickers, googly eyes, etc.
- Play dough, plasticine
- Building blocks, LEGO, Playmobil, etc.

Children and youth are not involved in choices about their lives and well-being.

Adults make a lot of choices and decisions for children and youth. They don't always ask children and youth what they want. Imagine if adults asked you more about what you wanted—at school, at home, and other places you go.

PROBLEM CARD

STEP

3

Want to know more?

Often, children and youth are not meaningfully involved in decisions that governments and social services make about their lives and well-being. As a result, young people's voices are not considered in decisions about community spaces, services and programs, curriculum, funding, and policy. When young people are not involved in these decisions, we miss out on their valuable input and may create solutions that are not best for them. We lack tools and processes that help young people feel informed, valued, and empowered to participate in decision-making that affects them.



How might we ensure children and youth are meaningfully involved in community decisions about programs, services, and policies related to their lives and well-being?

Discussion Activity

Have a discussion with your group about this problem area.
Here are some questions you might ask to get the conversation going:

What's a choice you wish you got to make?

When did you get to choose something?

How did that make you feel?

When didn't you get to choose something?

How did that make you feel?

ACTIVITY CARD

STEP

3

Tell a Story Activity

Create a story about a child/youth making an important choice or decision with an adult. Feel free to write, use puppets, make a skit, or draw the story.

Make a Thing Activity

Make something that would help adults listen to children/youth. You can draw the thing, or make it out of building blocks or craft supplies you have around you. With an older group, you can use the “How might we” question on the bottom of the Problem Card to prompt making and discussion.

Reflection Activity

It’s really important to reflect with children and youth about the things they make. After the activity is done, ask each child/youth or group to share what they made. Then, ask them some of the following questions:

Can you tell me why you made _____ (or told that story)?

What’s most important about the story/thing you made?

Children and youth find it hard to get help because they are embarrassed or scared to ask an adult to help.

It can be hard for children and youth to ask an adult for help. Sometimes, children and youth might feel embarrassed or scared. They might not trust an adult enough to ask them to help, or worry about what people will think.

PROBLEM CARD

STEP

3

Want to know more?

When children and youth face challenges, they can find it difficult to ask for help because of stigma. Peers, adults, and communities may reinforce expectations and stigma, making it harder to reach out when something is wrong. Legal requirements around disclosure and parental permission can make it difficult for young people to feel a sense of safety, privacy, and confidentiality. We need to build empathy and reduce stigma within our community. We need to provide resources that support caring adults and peers. This will make our community more open and caring for young people.



How might we make services and supports easier for young people to access by building empathy and challenging stigma in our region?

Discussion Activity

Have a discussion with your group about this problem area.

Here are some questions you might ask to get the conversation going:

When have you felt comfortable asking for help?

When have you felt too embarrassed, shy, or scared to ask for help?

Where do you find it easy to ask for help?

What could adults do to make you and your friend feel more comfortable asking for help?

ACTIVITY CARD

STEP

3

Tell a Story Activity

Create a story about a child/youth asking an adult for help with something really hard. Feel free to write, use puppets, make a skit, or draw the story.

Make a Thing Activity

Make something that would help children/youth feel better asking for help from adults. You can draw the thing, or make it out of building blocks or craft supplies you have around you.

With an older group, you can use the "How might we" question on the bottom of the Problem Card to prompt making and discussion.

Reflection Activity

It's really important to reflect with children and youth about the things they make. After the activity is done, ask each child/youth or group to share what they made. Then, ask them some of the following questions:

Can you tell me why you made _____ (or told that story)?

What's most important about the story/thing you made?

Young people are lacking life skills and are worried about it.

Part of growing up is learning how to do new things and take care of yourself. Children and youth sometimes don't get the chance to learn and practice skills that they will need when they are adults. This can be stressful.

PROBLEM CARD

STEP

3

Want to know more?

Young people feel that there are not enough opportunities to learn important life skills, including financial literacy and skills for civic engagement. They worry about facing these skill gaps as they become more independent and move into adulthood. Children and youth need more time, space, and support to practice and explore life skills with supportive adults and peers. We also need to create opportunities for young people and adults to work together to identify what life skills are important.



How might we create more engaging and effective opportunities in the region for young people to learn life skills, build their confidence and build resilience?

Discussion Activity

Have a discussion with your group about this problem area.
Here are some questions you might ask to get the conversation going:

- What are some things you do during a day?
- What are some things adults do during a day?
- What things do you want to learn how to do?
- How do you want to learn these things?
- Where do you want to learn them?
- Who do you want to learn from?
- How will you feel when you learn these things?
- What's in the way of you learning these things?

ACTIVITY CARD

STEP

3

Tell a Story Activity

Create a story about a child/youth learning how to do something that adults do. Feel free to write, use puppets, make a skit, or draw the story.

Make a Thing Activity

Make something that would help children/youth learn how to do something important. You can draw the thing, or make it out of building blocks or craft supplies you have around you.

With an older group, you can use the “How might we” question on the bottom of the Problem Card to prompt making and discussion.

Reflection Activity

It’s really important to reflect with children and youth about the things they make. After the activity is done, ask each child/youth or group to share what they made. Then, ask them some of the following questions:

Can you tell me why you made _____ (or told that story)?

What’s most important about the story/thing you made?

Share Ideas

What ideas did children and youth come up with? Please share the ideas and insights from your session with Smart Waterloo Region.

- Take pictures of the ideas and post to Twitter or Instagram using #SmartWR
- Go to smartwr.ca and post about the ideas in our online forum
- Email the ideas to smartwr@regionofwaterloo.ca

#SmartWR

Twitter: @SmartWatRegion
Instagram: @SmartWatRegion

smartwr.ca

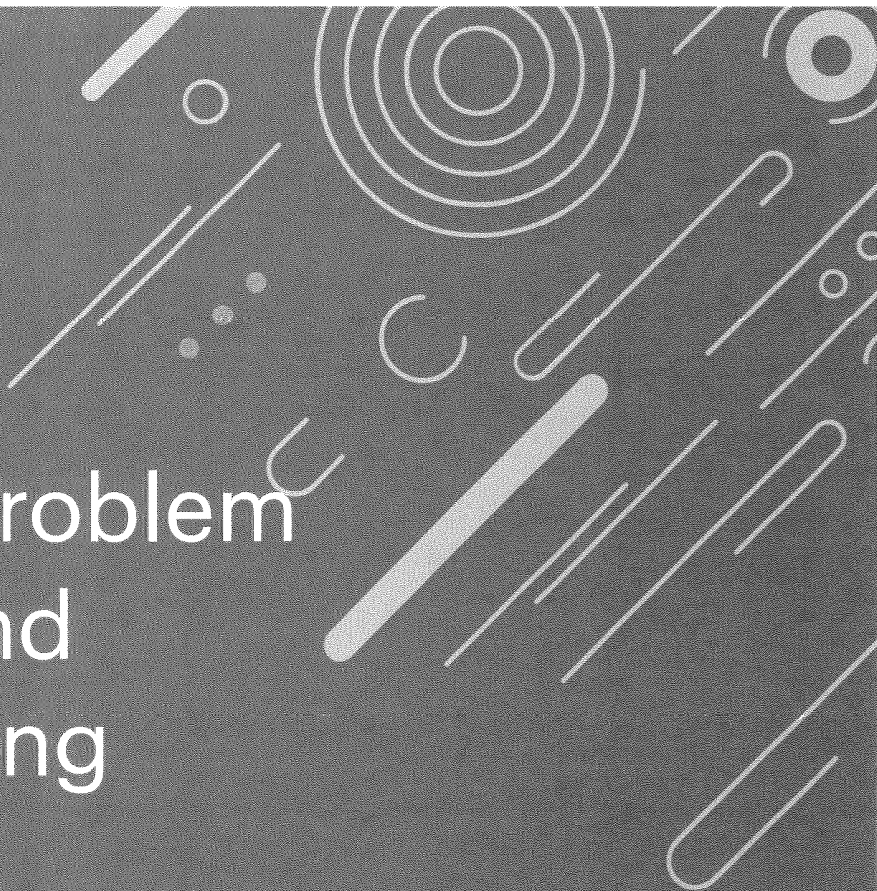
SHARE CARD

STEP

4

Guidelines for Sharing Ideas and Insights from Young People

- Ask the group if they are comfortable with you sharing their ideas and stories from the Idea Session.
- Give young people the opportunity to opt-out by speaking with you one-on-one.
- Please leave out names and other personal identifiers. We'd love to know the age range of young people involved in your session and the name of your city/town or organization.
- We're not just interested in ideas. We also want to hear about the conversations you had with the group and any feedback you have about how to improve this Idea Toolkit.



Repeat with other Problem
or Activity Cards, and
other groups of young
people.

STEP

5

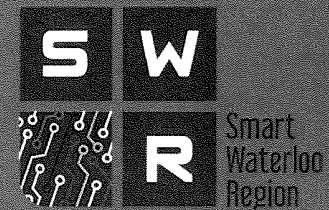


Thanks!

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12. Timeline for Projects: Extended, including dependencies

No.	Project	Start	Complete	Major Milestones (in order)	Dependencies
D1, S1	Connected Community Spaces	Q1 2020	Q4 2024	<p>Project scoping completed for: fibre to Township libraries and Community centres; Mobile Hotspot deployment across Waterloo Region; Piloting of 5G; Infrastructure and space requirements at libraries and community centres; Centre of Excellence; Indigenous Connected Community Space</p> <p>Fibre deployed to Township libraries and pre-identified community centres</p> <p>Retrofitting of spaces to support technology and data-enabled program delivery and support</p> <p>Mobile Hotspots deployed through library system to support children and youth</p> <p>5G pilot launched throughout Waterloo region</p> <p>Centre of Excellence retrofitted with technology and data-enabled programming</p> <p>Indigenous Connected Community Space retrofitted with technology and data-enabled programming</p>	<p>Partnership with Rogers Communications finalized for fibre, mobile hotspots, and 5G finalized</p> <p>Neighbourhood-Based program delivery and supports are developed in parallel with Enhancing Community Spaces</p>
D1	Child and Youth Well-being Public Awareness Campaign	Q4 2019	Q4 2024	<p>Five-year community campaign plan finalized</p> <p>Partnership support for campaign outreach finalized (Annual)</p> <p>Platforms for campaign identified (Annual)</p> <p>Campaign launched</p> <p>Review and impact measurement (Annual)</p> <p>Campaign plan updated (Annual)</p>	Community partners participation with community campaign
D1	Building Data Capacity	Q4 2020	Q4 2024	Data Capacity curriculum developed with technology and educational sector to support data capacity enhancement in child and youth service sector	Data experts and technology companies

Appendix A.

				Data training and capacity building curriculum implemented	support with training
D1	Building Data Capacity	Q4 2020	Q4 2024	Data Capacity curriculum developed with technology and educational sector to support data capacity enhancement in child and youth service sector Data training and capacity building curriculum implemented	Data experts and technology companies support with training
D2	Data Collaborative and Dashboard	Q4 2019	Q4 2021	Complete inventory of data available to be shared through dashboard finalized Data integrity and sharing principles finalized Data privacy and sharing agreements with partners finalized Data collaborative platform selected Machine learning solution adopted Dashboard for measurement framework and data sharing finalized Alignment with CY-Index Beta launch of Data Collaborative and Dashboard Full launch of Data Collaborative and Dashboard	Partner agreements for data sharing
D3	Indigenous Children and Youth Data Strategy	Q1 2020	Q4 2024	Partnerships finalized with local Indigenous child and youth service providers and communities to support with data collection Approach to data collection finalized Data collection initiated Integration with child and youth data collaborative	Receptiveness of local Indigenous communities
D4	Community Child and Youth Well-being Index Survey	Q4 2019	Q4 2021	Co-design of pilot with partners and youth complete Survey tool finalized	Ontario Trillium Foundation as

Appendix A.

				Survey implemented in community Integration with child and youth data collaborative	an invested partner
D5	Data Collection and Analysis in Schools	Q1 2020	Q3 2022	MDI has been aggregated and shared in data collaborative Development of test items for the YDI completed YDI pilot complete Full YDI implementation in Waterloo Region	Implementation of YDI dependant on successful pilot
E1	CoHealth	Q2 2020	Q3 2024	Project scoping of developmental milestones and community resourcing connection for first 2000 days Community partners and links to resourcing finalized Platform launched	Community partner and physician network integration with CoHealth app Interoperability with Family Compass
E2	Online Prenatal and Parenting Programming	Q4 2020	Q2 2022	Project scoping on current courses and tech-enabled supports Vendor selected Incorporation of parenting programming into Parenting Now Launch of App based version of prenatal course	Enhanced Parenting Now platform interoperability with Online Prenatal and Parenting Programming project
E3	Digital Early Learning Portfolios	Q2 2021	Q3 2023	Portfolio content and structure fully scoped Pilot participants identified	Parent consent for child participants

Appendix A.

				Digital Portfolios developed in beta form Testing of Portfolios Deployment of Portfolios Assessment of Pilot	
E4	Kindergarten Self-Regulation and Foundation Early Learning Skills	Q1 2021	Q3 2023	Schools prioritized for implementation System wide implementation of the Kindergarten Self-Regulation (KSR) Tool (Pre and Post Survey) Training of all Elementary Multi-Disciplinary Team Members across all schools complete	Continued positive outcomes
L1	Tablets for Family Literacy	Q1 2020	Q1 2021	Tablets acquired Tablets integrated into existing Family Literacy programming	NA
M1	Social-Emotional Learning in Schools (WCDSB)	Q1 2020	Q4 2024	Prioritization of schools complete Implementation in 22 schools Implementation scaled to 36 schools Implementation scaled to 50 schools	Continued positive outcomes Willingness of principals to participate
M1	Social-Emotional Learning in Schools (WRDSB)	Q1 2020	Q3 2022	Schools prioritized for scaling Pilot extended to 40 schools Pilot extended to 80 schools Full implementation in schools Implementation of parent/household social-emotional learning component	Continuous positive outcomes confirmed through data Willingness of principals to participate

Appendix A.

M2	Social-Emotional Health for Caring Adults	Q1 2020	Q4 2024	Vendor secured Partnership(s) established to help deliver training in community (through program delivery network) Training implemented Scaled to over 5,000 households Scaled to over 100 community organizations	Service delivery partners
M3	Virtual E-Counselling	Q1 2021	Q2 2022	Partnerships with Service Providers finalized Connected community spaces appropriate to support E-Counselling identified Platform for E-Counselling launched	Locations for E-counselling available at Connected Community Spaces
M4	Youth Mental Health Services App	Q2 2020	Q2 2022	Project scoping with mental health providers and youth complete Vendors selected App connected through API linked to booking system and available resources from different service providers launched in beta form Full launch of App complete	Family Compass platform interoperability
M5	Incentivizing Health Activities App	Q1 2021	Q3 2023	Project scoping complete Vendor secured App developed Pilot implemented	Corporate or community partners secured to support rewards
S1	Wi-Fi Network SSID	Q4 2020	Q3 2023	Municipal facilities across Waterloo Region adopt open SSID Private partners identified to adopt SSID	Municipal and private partner agreements

Appendix A.

S1	Indigenous Connected Community Space	Q2 2020	Q1 2022	Customized Indigenous programming developed Retrofitting of facility to support technology-enabled solutions Partners identified to support with program delivery or support services	Receptiveness of local Indigenous communities Linked to Neighbourhood-Based programming platform
S2	Connected Outdoor Spaces	Q1 2020	Q1 2023	Project scoping completed to identify specific outdoor spaces in each Township and City Project scoping to identify specific technology-enabled solutions (safety, physical and mental health solutions) Technology framework for each space finalized Vendor selected for each technology solution Integration of spaces with Neighbourhood-Based Program Delivery/Support Services platform Research on impacts of outdoor spaces on child and youth well-being completed Indigenous significant outdoor spaces identified, and supported with digitized content	Agreements for use of space finalized with School Boards Community support for identified outdoor spaces Support of additional Indigenous community partners in development of digitized content for outdoor spaces
S2	Digitization of Local Indigenous Historical Content	Q1 2021	Q3 2022	Project scoping with local Indigenous communities to identify significant landmarks and historical content to be digitized Content digitized	Receptiveness of local

Appendix A.

					Indigenous communities Dependant on Connected Outdoor Space project roll-out
S3	Engaging and Innovative Learning Environments (Third Teacher)	Q2 2020	Q3 2024	Full project implementation in 15 priority schools Flexible equipment implemented in 396 classrooms	Available physical space to implement
S4	Digital Citizenship for Children, Youth, and Caring Adults	Q1 2020	Q4 2024	Community engagement completed Strategy completed Train the trainer programming across the community Implementation of Strategy by Community Partners Research and assessment of impact	Partner's willingness to implement Strategy across community
S4	Internet Safety - Low German Mennonite Population	Q4 2021	Q3 2024	Training Program Developed Community delivery partners/leaders established and outreach program finalized Pilot implemented	LGM Community receptiveness to training
S5	VolunteerAttract	Q1 2020	Q3 2021	Alignment of volunteering opportunities with SDGs Gamification technology developed or adopted Scaling plan to volunteer organizations in other communities finalized	N/A
S6	E-Mentorship Matching	Q2 2021	Q2 2023	Mentorship network established Framework for mentor selection New E-platform developed and launched	Partner organizations supporting

Appendix A.

					mentor identification
S7	Strengthening Newcomer Pathways	Q3 2020	Q3 2022	Project scoping with newcomer youth and partner organizations completed E-resources, e-counselling and translation needs identified Platform identified and developed Platform launched in beta form Full platform launched Knowledge transfer of pilot to other pre-identified Canada communities	Staffing to support in-person services from increased newcomer youth participation
S8	Welcoming Newcomer Children and Families to Licensed Child Care	Q2 2020	Q3 2021	Project scoping for Virtual Human library/catalogue completed Pilot participants identified Training curriculum for educators and licensed child care providers completed Virtual library and app developed and tested Deployment and assessment complete	Child and organizational participants identified for pilot Parent consent for child participants
S9	Re-Engagement Program (WCDSB)	Q 2020	Q3 2022	Implementation in St. Mary's family of schools Implementation in St. David's family of schools Implementation in Resurrection family of schools	Partnership with YMCA Partnership with Community Justice Initiatives (CJI)
S9	Re-Engagement Program (WRDSB)	Q1 2020	Q3 2023	Teacher trained on myBlueprint and myWay. Process for gathering data established Data collected and analyzed using predictive analytics	Willingness of disengaged students to provide data

Appendix A.

S10	Indigenous Child and Youth Leadership Program	Q4 2019	Q3 2020	Digital Repository of Indigenous Resources developed and populated e-PD Training developed On-line tracking tool to share learnings developed	Willingness of Indigenous students participate in program
R1	Family Compass Platform	Q4 2020	Q4 2022	Project scoping with community partners Platform management plan finalized Interoperability plan finalized Data and information collection and management plan for new platform finalized Vendors selected for new platform development Beta launch of new platform Full launch of new platform	Local organization identified to manage implementation of new platform
R1	OneList	Q4 2020	Q4 2022	Inventory of licensed child care Develop process to fill vacant spots API for connecting licensed child care selected API launched	Participation from licensed child care providers in Waterloo Region
R1	Parenting Now	Q4 2020	Q4 2022	Project scoping on new resources and live supports Platform enhancements with chat functionality Connection established to Online Prenatal and Parenting Programming project Launch of enhanced platform	Timing of Online Prenatal and Parenting Programming
R1	Recreation Fee Assist	Q1 2021	Q2 2022	Comprehensive listing of recreation programs complete Maintenance plan for tracking programming finalized	Recreation programming

Appendix A.

				Additional municipalities utilizing Fee Assist. Smart technology implemented for Fee Assist	providers participation
R2	Shared Electronic Records System	Q4 2019	Q3 2020	Pilot participants identified Data sharing requirements finalized Licenses acquired Launch of pilot project	Sample size of volunteer families is large enough to support pilot
R3	Neighbourhood-Based Program/ Service Delivery	Q2 2020	Q2 2024	Project scoping for partners, programs, delivery, registration and platform complete Vendor selected Platforms developed Neighbourhood-Based Platform launched	Interoperability with Family Compass
R3	After School Community Connections	Q4 2020	Q4 2024	Project scoping for pilot to identify infrastructure, partner organizations, available and needed programs, and registration Transfer process from school to after school programs finalized Assessment of impact on youth participating in after school programming	Neighbourhood-Based programming platform interoperability
R4	STEAMing Ahead	Q1 2020	Q3 2022	Prioritization of schools complete Implementation in 15 top prioritized schools Implementation scaled to 30 schools Implementation scaled to 45 schools	Partnership with Business Education Partnership (BEP)
R4	Indigenous STEAM programming	Q1 2020	Q3 2024	Engagement of Indigenous communities to inform program development completed Programming developed and launch Scaling plan finalized	Receptiveness of local and national Indigenous partners

Appendix A.

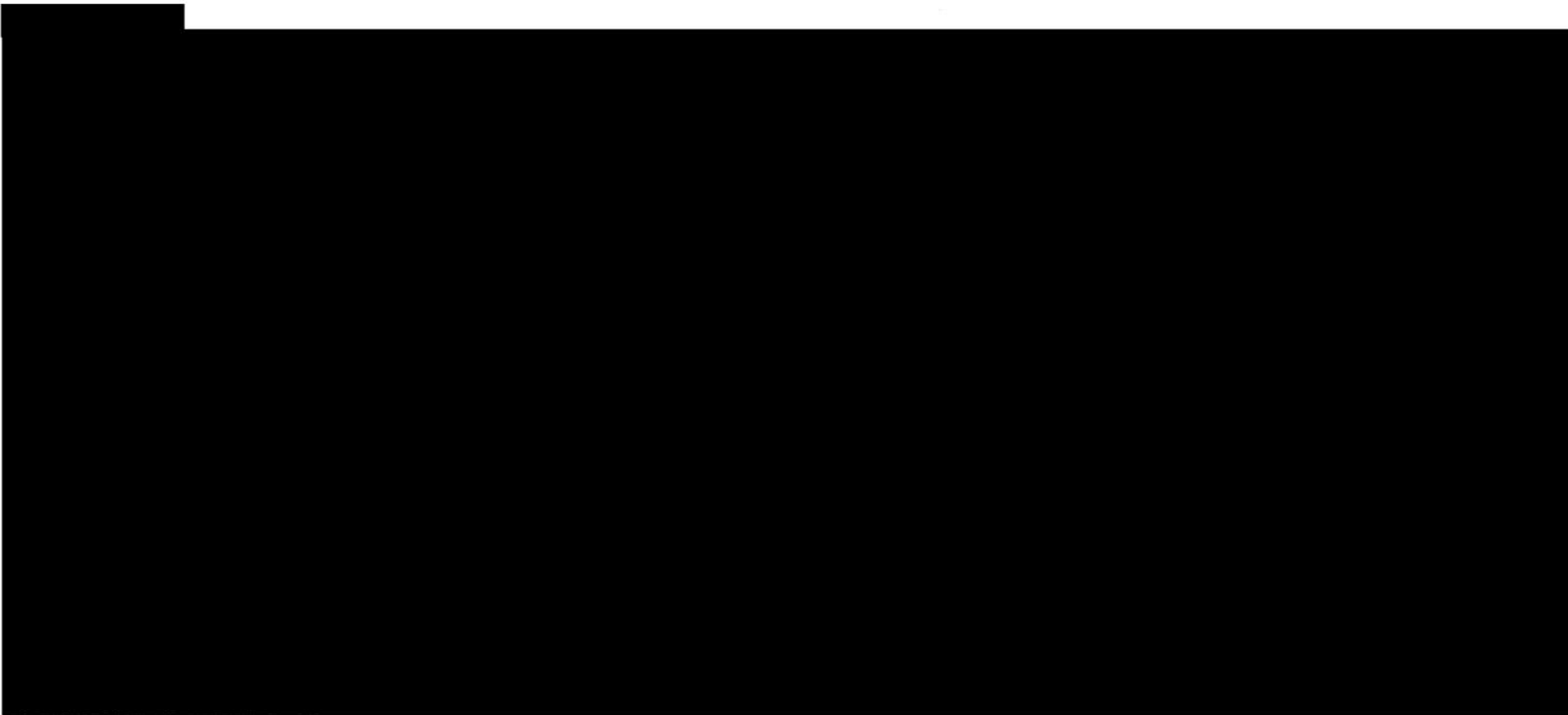
					assisting in program development
R4	STEAM in the Early Years	Q1 2020	Q3 2022	Technology enabled materials and equipment determined Teaching strategies developed Pilot implemented	Parental consents for children to participate in program
R5	Future of Work and Learning	Q4 2019	Q3 2021	Corporate and service delivery partners identified to support training Career connected programming and curriculum developed for children and youth Life Skills programming and curriculum developed for children and youth Program delivery Impact assessment	Corporate and service delivery partners support with curriculum development
R6	In Pursuit of Racial Justice	Q1 2020	Q3 2024	All secondary schools engaged in project Digital Repository of Equity and Inclusion Resources developed and populated e-PD Training developed On-line tracking tool to share learnings developed	Willingness of students to identify with, and share their experiences of being racialized
R7	Child Friendly Cities Initiative	Q4 2019	Q4 2024	Criteria for child friendly cities established Implementation initiated	Support from municipalities for the criteria established
NA	French School Boards and KidsAbility School Board (Scaling of Prioritized	Q4 2020	Q4 2024	Projects identified for French school boards Projects identified for KidsAbility	Appropriate fit of projects with

Appendix A.

	WRDSB and WCDSB solutions)			Projects implemented and connected to WCDSB and/or WRDSB milestones and outcomes	French school boards Appropriate fit of projects with KidsAbility School Board
NA	Future Technology or Data-Enabled Solutions identified as support to the Smart Waterloo Region initiative	Q4 2019	Q4 2024	Screening criteria and selection process established Annual projects awarded	Letter of Partnership finalized with community funding partners

Appendix A.

14. Budget: Extended, including sources of funding per project



Appendix A.

**Page(s) 924 to 945
are withheld
pursuant to paragraph
13(1)(d) and 20(1)(b)
of the *Access to Information Act***

**La/les page(s) 924 à 945
Font l'objet d'une exception totale
conformément aux dispositions de paragraphe
13(1)(d) and 20(1)(b)
de la *loi sur l'accès à l'information***



Appendix B

Smart Waterloo Region Logic Model

Smart Waterloo Region Logic Model

Impact
Waterloo Region will be the benchmark community for child and youth well-being in Canada.

Long Term Outcomes and Performance Measures

Area of Focus	Long Term Outcome	Indicator	Source	Baseline	Target (2024)
Early Childhood Development	Decrease the percentage of children not ready for school with the skills needed. †	Percentage of Senior Kindergarten (SK) children in Waterloo Region who are vulnerable to difficulties in learning on the Early Development Instrument (EDI) (scoring low in one or more domains <10th percentile).	EDI, Ministry of Education. (2015)	32.8%	26.0%
Literacy	Increase the percentage of children reading well in primary school. †	Percentage of all Grade 3 students at or above the Provincial Standard for reading.	Grade 3 EQAO, EQAO. (2016)	67.0%	75.0%
Literacy	Increase the levels of reading achievement among Grade 10 students. † (Proxy)	Percentage of fully participated students (first time eligible) who were successful on the Ontario Secondary School Literacy Test (OSSLT).	Grade 10 OSSLT, EQAO. (2016)	82.0%	85.0%
Mental/emotional health	Improve the social-emotional well-being of children. †	Percentage of SK children in Waterloo Region who are vulnerable in the emotional maturity domain (i.e., scoring low, < 10th percentile) on the EDI.	EDI, Ministry of Education. (2015)	14.8%	12.0%
Mental/emotional health	Increase the percentage of youth self-reporting positive mental health. †	Percentage of youth, 12 to 17, having positive self-rated mental health.	CCHS, Statistics Canada. (2014)	80.4%	82.0%
Sense of Belonging	Increase the level of social cohesion in Waterloo Region. † (Proxy)	The level of social cohesion, as measured by the Social Cohesion Index.	Kindergarten Parent Survey, Offord Centre. (2015)	7.6 / 10	8.2 / 10
Sense of Belonging	Increase the level of sense of belonging to the local community among youth. †	Percentage of youth, 12 to 17, with a "very strong" or "somewhat strong" sense of belonging to their local community.	CCHS, Statistics Canada. (2014)	78.6%	84.0%

Technology- and Data-Enabled Activities and Outcomes

Number	Name	Activities/Outputs	Immediate Outcomes	Intermediate Outcomes
D1	Centre of Excellence for Child and Youth Well-being	Ongoing data, research and knowledge activities: <ul style="list-style-type: none"> Coordinate research projects Knowledge mobilization Support data and research capacity among service providers 	A. Increased awareness of local data related to child and youth well-being B. Improved basic data and research skills among service providers	C. Increased capacity among service providers to use data and research to support programming D. Increased capacity to use data to support child and youth well-being
D2	SWR Data Collaborative and Child and Youth Well-being Dashboard	Develop and administer the SWR Data Collaborative and Real-time Child and Youth Well-being Dashboard.	A. Improved understanding of child and youth well-being and the influencing factors	B. Programs and services better meet the needs of children and youth
D3	Indigenous Child and Youth Data Strategy	Explore approaches that lead to having a better sense of how many Indigenous children and youth there are in our community.	A. Increased accuracy of Indigenous demographic/population data	B. Improved programming and supports for Indigenous children, youth and families
D4	Community Child and Youth Well-being Survey	Develop and implement a community child and youth well-being survey aligned with the CY-Index.	A. Improved ability to measure child and youth wellbeing at a community level B. Increased sense of feeling valued, heard and included by youth participants	C. Improved knowledge of child and youth wellbeing
D5	Data Collection & Analysis in Schools	Support WRDSB's student data collection and analysis (MDI/YDI).	A. Increased availability and quality of data related to student well-being	B. Increased capacity to use data to support the well-being and academic outcomes for students
E1	CoHealth	Support parents/caring adults and primary care providers through the first five years of a child's life. Develop and implement platform.	A. Increased awareness of key milestones and supports B. Increased awareness of the importance of the early years and early literacy C. Improved ability for families to self-manage their health care † (Proxy)	D. Increased rates of Well-Baby Visit participation E. Increased use of early childhood programming and supports † (Proxy) F. Increased rates of vaccinations †

		Customize messages and supports to Waterloo Region to share key milestones and messages, appointments and resources.		
E2	Online Prenatal and Parenting Program	Pilot online prenatal and parenting programming.	A. Increased access to prenatal and parenting programming and supports	B. Increased skills of parents and caring adults C. Improved birth weights † D. Reduce number of families identified as "with risk" at time of birth
E3	Digital Early Learning Portfolio	Support Conestoga College in the the pilot of a digital early learning portfolio template.	A. Improved consistency among early learning and child care providers in early childhood development documentation B. Improved transferability of knowledge between child care to school	C. Improved parent-educator partnership
E4	Kindergarten Self-regulation and Foundational Early Learnings Skills	Support WRDSB's self-regulation and foundational early learning skills pilot programming for Kindergarten children.	A. Improved self-regulation skills among students participating in the program † (Proxy)	B. Increased capacity of educators to use data to inform instructional decision making in the areas of self-regulation C. Improved academic outcomes (e.g., literacy, mathematics) † (Proxy)
L1	Tablets for Family Literacy	Pilot the use of tablets for families participating in family literacy programming	A. Increased number of program participants who report enjoying reading together.	B. Increased number of program participant families who are better able to connect to community resources. C. Increased access to preschool learning opportunities †
M1	Social- Emotional Learning in Schools	Support the continued development, implementation and evaluation of an approach to support the social-emotional learning of children and youth in schools.	A. Increased knowledge of educators about social-emotional strategies and practices B. Improved social-emotional skills among students	D. Improved practice of educators about social-emotional strategies E. Improved social-emotional health of students † (Proxy)

			C. Improved social-emotional skills among teachers	F. Increased high school graduation rates † (Proxy)
M2	Social- Emotional Learning for Caring Adults	Develop and implement an approach, to support the social-emotional learning of parents/caring adults and service providers.	A. Increased parent/caring adult awareness of the importance of social-emotional skills for children and youth B. Increased parent/caring adult awareness of importance of social-emotional skills for self	C. Increased parent/caring adult social-emotional skills D. Increased child/youth social-emotional skills
M3	Virtual Counselling	Pilot virtual counselling for children, youth as well as for parents/caring adults, prioritizing rural communities.	A. Reduce the barriers in accessing mental health supports	B. Increased use of mental health supports † (Proxy)
M4	Youth Mental Health Services App	Develop an app for youth to confidentially access mental health information, resources and support services.	A. Increased number of youth able to self-navigate health supports.	B. Increased use of mental health supports † (Proxy)
M5	Incentivizing Health Activities App	Pilot a proactive physical and mental health app that support positive well-being of children, youth and parents/caring adults.	A. Increased awareness of positive health and well-being	B. Increased physical health activity † (Proxy)
S1	Connected Community Spaces	Connected community spaces implemented: <ul style="list-style-type: none"> • Extend fibre to municipally owned buildings • Hotspot borrowing program • Region-wide SSID Wi-Fi access available in public buildings and spaces • Pilot of 5G high speed internet access • Support Indigenous EarlyON as a connected community space for Indigenous children and families 	A. Reduced barriers in accessing internet	B. Increased access to programming and services C. Increased access to resources and tools for students
S2	Connected Outdoor Spaces	Connected outdoor spaces implemented: <ul style="list-style-type: none"> • Outdoor spaces are connected to internet and technology including sensors and health promotion apps 	A. Increased used of parks and outdoor spaces B. Increased in Indigenous interest † (Proxy)	C. Increased participation in physical activity D. Increased knowledge of local history

		<ul style="list-style-type: none"> Digitization of local Indigenous historical content for park/natural spaces] <p>University of Waterloo is supported in outdoor environments impact on child and youth well-being.</p>		
S3	Engaging and Innovative Learning Environments (Third Teacher)	Support WCDSB in the implementation of technology supported learning environments to inspire well-being, engagement and innovation.	<p>A. Technology and resources are more accessible to schools</p> <p>B. Increased ability for classrooms to meet the needs of students</p>	C. Increased engagement in classroom† (Proxy)
S4	Digital Citizenship Strategy	Development of a community-wide Digital Citizenship strategy including, customized strategies/programming for LGM population.	A. Increased understanding of appropriate interactions and uses of the internet and social media	<p>B. Increased access to services and supports by the LGM population</p> <p>C. Decreased reporting of online bullying and harassment</p>
S5	Meaningful Volunteering Platform (VolunteerAttract)	Support VAC in the implementation of VolunteerAttract platform.	A. Increased awareness of volunteer opportunities	B. Increased rates of youth volunteering
S6	E-mentorship Matching	Lead the development of an E-mentoring matching portal.	<p>A. Increased awareness of mentorship among youth</p> <p>B. Increased awareness of mentorships among mentors</p>	C. Increase in youth feeling supported by the community † (Proxy)
S7	Strengthening Newcomer Pathways	Support a new e-platform to reach more newcomer youth and connect them to available services.	A. Increased participation of newcomers in recreational activities and supportive activities	B. Increased number of newcomer youth in the program feeling supported by caring adults.
S8	Welcoming Newcomer Families to Licensed Child Care	Support the pilot of Conestoga College's newcomer program families in licensed child care.	A. Increased understanding of the varied life experiences of newcomer Canadians by child care providers.	B. Improve licensed child care to better meet the needs of newcomer children and families
S9	Re-engagement of Students	Support WCDSB and WRDSB re-engagement programs.	<p>A. Increased academic participation</p> <p>B. Increased access to supports and resources for youth</p>	<p>C. Increased high school graduation rates† (Proxy)</p> <p>D. Increased in youth feeling supported by the community †</p>

S10	Indigenous Child and Youth Leadership Program	Support WRDSB Indigenous Children and Youth Leadership Program (land-based learning) project.	A. Indigenous students feel valued and supported in their educational experience	B. Increase Indigenous student engagement and achievement
R1	Family Compass Platform	Develop and implement Family Compass Platform to support youth and families to navigate and access services including: <ul style="list-style-type: none"> OneList Parenting Now Recreation Fee Assist 	A. Increased awareness for families, youth and service providers of the programs and supports available within our community B. Decreased barriers to accessing programs and services in our community	A. Decreased number of children with undiagnosed needs B. Increased access to licensed child care † (PROXY) C. Increased number of parents accessing supports D. Increase use of recreation programming † (PROXY)
R2	Shared Electronic Health Record	Support Special Needs Strategy Planning Table's pilot of shared electronic health records for children with special needs.	A. Improved interoperability between service providers	B. Increased satisfaction with service delivery for families C. Improved timeliness of services and supports
R3	Neighbourhood-based Program/Service Delivery	Support the mapping of community assets at the neighbourhood level: existing resources, infrastructure, spaces and programming, including after-school community activities. Incorporate a specific focus on after-school activities and programming.	A. Increased efficiency/interoperability in delivering programming and supports to children, youth and families B. Increased responsiveness of programs	C. Increased access to programs and supports
R4	STEAM Programming for Underrepresented Children and Youth	Support STEAM programming for underrepresented children and youth: <ul style="list-style-type: none"> Support Conestoga College in licensed child care WCDSB experiential STEAM learning (prioritized to female students) Perimeter Institute programming to Indigenous children and youth 	A. Increased access to STEAM programming	B. Increased participation in STEAM programming from groups that are traditionally less engaged
R5	Future of Work and Learning	Support community partners in the delivery of Future of Work and Learning.	A. Increased efficiency in delivering entrepreneurial and life skills training	C. Increased access to entrepreneurial and life skills training

			B. Increased life skills programming offered to youth	D. Decrease in youth anxiety due to a feeling of a lack of life skills
R6	In Pursuit of Racial Justice	Support WRDSB in the Implementation of In Pursuit of Racial Justice.	A. Improve student awareness of racism and the systemic barriers to equality † (Proxy) B. Increase staff awareness of racism, white privilege and the systemic barriers to equity	E. Decreases in reported incidents of racists behaviours and microaggressions † (Proxy)
R7	Child Friendly Cities Initiative	Co-design and implement a Canadian approach to UNICEF's global Child Friendly Cities Initiative.	A. Increase awareness of the benefits and opportunities of being a child-friendly city B. Increase awareness of the UN Rights of the Child and SDGs † (Proxy)	C. Increase in child-friendly policies/ practices D. Increase in child and youth well-being as a shared society priority

Data, Research and Knowledge Performance Measures

Data Note: All outcome indicators for Data, Research and Knowledge will be developed in partnership with community partners and the DSPC through implementation. Outcomes related to Data, Research and Knowledge will not be aligned to the CY-Index.

Number	Indicator
D1	<ul style="list-style-type: none"> Research projects coordinated Knowledge mobilization activities completed Data and research capacity of service providers supported Five-year community campaign plan finalized and launched
D2	<ul style="list-style-type: none"> Complete inventory of data available to be shared through the Dashboard finalized Data integrity and sharing principles finalized Data privacy and sharing agreements with partners finalized SWR Data Collaborative platform selected AI/ML solution(s) adopted Beta of SWR Data Collaborative and Dashboard launched Full SWR Data Collaborative and Dashboard launched
D3	<ul style="list-style-type: none"> Partnerships finalized with local Indigenous child and youth service providers and communities to support with data collection

	<ul style="list-style-type: none"> • Approach to data collection finalized • Data collection initiated • Integration with SWR Data Collaborative explored
D4	<ul style="list-style-type: none"> • Co-design of pilot with partners and youth completed • Survey questions and tool finalized • Survey implemented in community • Knowledge mobilization/scaling activities completed
D5	<ul style="list-style-type: none"> • MDI aggregated and shared in the SWR Data Collaborative on bi-annual basis • YDI pilot completed and evaluated

Technology- and Data-Enabled Performance Measures

Number	Output/ Outcome	Indicator	Source	Baseline	Target
E1	Outputs	<ul style="list-style-type: none"> • Platform developed, implemented and shared with families • Messages and supports customized to Waterloo Region • Ongoing evaluation and additions made to the messages and supports 			
E1	A	Percentage of families unable to find services to help their child.	Kindergarten Parent Survey, Offord Centre. (2015)	5.3%	4.0%
E1	B-C	To be developed in partnership with WWLHIN and YMCA CKW.	NA	NA	NA
E1	D	Percentage of children, 12 to 24 months, who have had the enhanced 18 month Well Baby visit with a primary care provider.	Ontario Ministry of Health and Long-Term Care, Ontario Health Insurance Plan Approved Claims. (2015)	57.2%	65.0%
E1	E	Number of visits to EarlyON Child and Family Centres across Waterloo Region.	YMCA Early Years, Our Place Resource Centre, Cambridge Early Years Family Centre. (2015-2016)	80,000	90,000
E1	F	Percentage of 2 year olds receiving at least one dose of measles vaccination.	Childhood National Immunization Coverage Survey, Stats Canada	Data in progress	Data in progress

E2	Output	<ul style="list-style-type: none"> Project scoped Vendor(s) selected Incorporation of parenting programming into Parenting Now Platform App launched 			
E2	A	Percentage of first-time moms who attended prenatal classes.	Better Outcomes Registry and Network Information (BORN) System, BORN (2017)	41.6%	48.0%
E2	B	Percentage of Meaningful Clinical Improvement increased among parents/caring adults.	Pre- and Post- Questionnaire, KW Counselling	NA	NA
E2	C	Percentage of singleton infants born small for gestational age (less than 10th percentile).	BORN Information System Better Outcomes Registry and Network. (2017)	8.7%	TBD
E2	D	Percentage of Healthy Babies, Healthy Children screens completed postpartum identified "with risk".	Healthy Babies, Healthy Children, ROW Public Health. (2017)	63.0%	TBD
E3	Outputs	Pilot completed: <ul style="list-style-type: none"> Portfolio content and structure fully scoped Pilot participants identified Digital Portfolios developed and tested Evaluation completed 			
E3	Outcomes	To be developed in consultation with Conestoga College.	NA	NA	NA
E4	Output	Pilot completed: <ul style="list-style-type: none"> Schools prioritized for implementation System wide implementation of the Kindergarten Self-Regulation (KSR) Tool Training of all Elementary Multi-Disciplinary Team Members across all schools complete 			
E4	A	Percentage of students in the program with improved self-regulation skills.	Kindergarten Self-Regulation (KSR) Tool, WRDSB	NA	NA
E4	B	Percentage of educators' with increased use of new knowledge and skills.	Program specific evaluation, WRDSB	NA	NA

E4	C	Percentage of students achieving grade level benchmarks in reading.	Nelson PM Benchmark Reading Assessment, WRDSB	Data in progress	100%
L1	Outputs	Pilot completed: <ul style="list-style-type: none"> Tablets acquired Tablets integrated into existing Family Literacy programming Evaluation completed 			
L1	Outcomes	To be developed in consultation with Project Read.	NA	NA	NA
M1	Outputs	School boards are supported in the ongoing delivery of social-emotional learning programs: <ul style="list-style-type: none"> Prioritization of schools completed Program delivered in existing schools then scaled to all schools in Waterloo Region (WCDSB, WRDSB) Evaluation completed annually 			
M1	A	Percentage of educators' with increased knowledge of social- emotional strategies and practices.	School Board (WCDSB, WRDSB) specific evaluation	NA	NA
M1	B	Percentage of students in the program with improved social emotional skills.	MDI, WCDSB/WRDSB & School Board specific evaluation	NA	NA
M1	C	Percentage of educators' with improved social emotional skills.	School Board specific evaluation	NA	NA
M1	D	Improved practice of educators about social emotional strategies.	School Board specific evaluation (WCDSB, WRDSB)	NA	NA
M1	E	Improved social-emotional health of students.	MDI, WCDSB/WRDSB & School Board specific evaluation	NA	NA
M1	F	Percentage of students across Waterloo Region receiving a diploma within 5 years of starting high school	Ministry of Education (2017)	82.4%	87.0%

M2	Outputs	<ul style="list-style-type: none"> • Vendor secured • Partnership(s) established to help deliver training in community • Training materials developed and implemented • Scaled to over 5,000 households and to over 100 community organizations 			
M2	A - D	Outcomes to be developed in partnership with community and successful vendor.	NA	NA	NA
M3	Outputs	Pilot completed: <ul style="list-style-type: none"> • Partnerships with Service Providers finalized • Platform for E-Counselling launched • Evaluation completed 			
M3	A	To be developed with WWLHIN and Rural Child and Youth Wellbeing Initiative	NA	NA	NA
M3	B	Percentage of youth (12 to 17) who have seen or talked to a mental health professional about their emotional or mental health in the past 12 months	CCHS, Statistics Canada (2009-2016)	9.6%	12.0%
M4	Outputs	Youth mental health service application implemented: <ul style="list-style-type: none"> • Project scoping with mental health providers and youth completed • Vendors selected • Application connected through API linked to booking system and available resources from different service providers launched in beta form • Application launched 			
M4	A	Percentage of youth who report experiencing difficulties getting health information or advice.	CCHS, Statistics Canada	Data in progress	Data in progress

M4	B	Percentage of youth (12 to 17) who reported having a barrier to improving their health.	CCHS, Statistics Canada (2007-2008)	27.0%	TBD
M5	Outputs	Pilot completed: <ul style="list-style-type: none"> • Project scoping completed • Vendor secured • Application developed and launched • Evaluation completed 			
M5	A	To be developed with community partners and successful vendor.	NA	NA	NA
M5	B	Percentage of youth (12 -17) who are meeting the Canadian Physical Activity Guidelines	CCHS, Statistics Canada (2009-2016)	8.8%	TBD
S1	Outputs	<ul style="list-style-type: none"> • Project scoping completed • Fibre extended to existing municipally-owned community facilities in rural communities • Hotspot Borrowing program expanded across Waterloo Region • Region-wide SSID Wi-Fi completed • 5G pilot completed • Retrofitting of spaces to support technology and data-enabled program delivery and support at Connected Community Spaces locations completed • Partners to support with program delivery or support services identified. 			
S1	Outcomes	To be developed in partnership with the Region of Waterloo, area municipalities and community partners.	NA	NA	NA
S2	Outputs	<ul style="list-style-type: none"> • Project scoping completed to identify specific outdoor spaces and technology- enabled solutions 			

		<ul style="list-style-type: none"> Technology framework for each space finalized Vendor selected for technology solutions Integration of spaces with Neighbourhood-Based Program Delivery/Support Services platform Research on impacts of outdoor spaces on child and youth well-being completed Indigenous significant outdoor spaces identified, and supported with digitized content University of Waterloo outdoor environment impact research is supported 			
S2	A	To be developed in partnership with community partners.	NA	NA	NA
S2	B	Percentage of children participating in a physical activity once a week or more.	Kindergarten Parent Survey (KPS), Offord Centre (2015)	69.8%	75.0%
S3	Outputs	<ul style="list-style-type: none"> Third Teacher principles implemented in 15 priority schools Flexible equipment implemented in 396 classrooms 	WCDSB		
S3	A	Technology ratios show investments are enhancing the number of devices per student at the 15 target schools	WCDSB Multi-Year IT Strategic Plan	Chromebook ratios 3: 1	2:1
S3	B	<ol style="list-style-type: none"> Increase in affirmative responses by staff to Staff Professional Development survey Increase in affirmative responses by students to School Climate Survey 	<ol style="list-style-type: none"> WCDSB Multi-Year Strategic Plan System Survey MDI, WCDSB 	Data in progress	Data in progress
S3	C	Percentage of affirmative responses by students to School Climate Survey	MDI, WCDSB	Data in progress	Data in progress
S4	Outputs	Digital Citizenship Strategy developed and implemented: <ul style="list-style-type: none"> Community engagement completed Train the trainer programming across the community implemented Implementation of Strategy by community partners Evaluation completed 	Digital Citizenship Strategy - TBD LGM Pilot - Rural Child and Youth Well-being initiative		

		LGM pilot completed: <ul style="list-style-type: none"> • Training program developed • Community delivery partners/leaders established • Outreach program finalized • Evaluation completed 			
S4	A-C	To be developed in partnership with community partners, including school boards	NA	NA	NA
S5	Outputs	<ul style="list-style-type: none"> • Volunteer opportunities aligned with SDGs • Gamification technology developed • Scaling plan to volunteer organizations in other communities finalized 			
S5	A-B	To be developed in partnership with Volunteer Action Centre and Volunteer Canada.	NA	NA	NA
S6	Outputs	<ul style="list-style-type: none"> • Mentorship network established • Framework for mentor selection developed • E-platform developed and launched 			
S6	Outcomes	To be developed in partnership with community partners.	NA	NA	NA
S7	Outputs	<ul style="list-style-type: none"> • Project scoped with newcomer youth and partner organizations completed • E-resources, e-counselling and translation needs identified • Platform identified and developed • Platform launched • Full platform launched • Knowledge transfer of pilot to other pre-identified Canada communities 			
S7	A - B	Percentage of youth moving from Challenged to Vulnerable to Adequate to Thriving	Developmental Assets Profile, Search Institute	<i>Asset Scores</i> 27% <i>Challenged</i> 37% <i>Vulnerable</i> 31% <i>Adequate</i> 4% <i>Thriving</i>	10% positive shift

S8	Outputs	Pilot completed: <ul style="list-style-type: none"> Virtual Human Library of newcomer experiences developed and shared Opportunities to expanded to licensed child care programs Evaluation completed 			
S8	Outcomes	To be developed in partnership with Conestoga College and licensed child care providers.	NA	NA	NA
S9	Outputs	Implementation as per respective School Boards' Strategic Plans completed			
S9	A - B	To be developed with WCDSB and WRDSB	NA	NA	NA
S9	C	Percentage of students across Waterloo Region receiving a diploma within 5 years of starting high school	Ministry of Education (2017)	82.4%	87.0%
S9	D	Percentage of youth (12-17) who feel confident to think or express their own ideas and opinions every day or almost every day in the past month	CCHS, Statistics Canada (2011-2012)	87.8%	90.0%
S10	Outputs	<ul style="list-style-type: none"> Digital Repository of Indigenous Resources developed and populated e-PD Training developed On-line tracking tool to share learnings developed 			
S10	A	Indigenous students will feel valued and supported in their educational experience.	TBD- Online tracking tool, self-report survey and/or focus groups with students	NA	NA
S10	B	Percentage of Indigenous students' with increased engagement and academic achievement.	TBD - Report Card, self-report survey and/or focus groups with students	NA	NA
R1	Outputs	Family Compass Platform developed, implemented and shared across the community: <ul style="list-style-type: none"> Project scoped with community partners (particularly CYPT, ROW Children's Services, KW Counselling, YMCA CKW) Platform management and interoperability plan finalized 			

		<ul style="list-style-type: none"> Data and information collection and management plan for new platform finalized Vendors selected for new platform development 			
R1	A-C, E	To be developed in partnership with CYPT and community partners.	NA	NA	NA
R1	D	Percentage of 0-4 year olds with access to licensed child care (centre based only).	Children's Services, Region of Waterloo. (2018)	21.4%	23.0%
R1	F	Percentage of children who have participated in physical activity or sport in the last 12 months.	KPS, Offord Centre. (2015)	90.5%	93.0%
R2	Outputs	Pilot completed: <ul style="list-style-type: none"> Pilot participants identified Data sharing and personal information requirements finalized Licenses acquired Pilot launched and evaluated 			
R2	A-C	To be developed in partnership with the Special Needs Strategy Planning Table.	NA	NA	NA
R3	Outputs	<ul style="list-style-type: none"> Project scoped for partners, programs, delivery, registration and platform Vendor selected Platforms developed Neighbourhood-Based Platform launched Transfer process from school to after school programs finalized Evaluation completed. 			
R3	A-C	To de developed in partnership with community partners.	NA	NA	NA
R4	Outputs	Conestoga College STEAM program is piloted in licensed child care: <ul style="list-style-type: none"> Technology enabled materials and equipment determined 			

		<ul style="list-style-type: none"> • Teaching strategies developed • Pilot implemented <p>WCDSB experiential STEAM learning is supported and expanded, as per WCDSB's Strategic Plan.</p> <p>Perimeter Institute supported:</p> <ul style="list-style-type: none"> • Engagement of Indigenous communities to inform program development completed • Programming developed and launched • Scaling plan finalized • Prioritization of schools completed 			
R4	A-C	To be developed in partnerships with STEAM partners.	NA	NA	NA
R5	Outputs	<p>Pilot completed:</p> <ul style="list-style-type: none"> • Corporate and service delivery partners identified • Career connected programming and curriculum developed • Life skills programming and curriculum developed • Program delivered • Evaluation complete 			
R5	A-D	To be developed in partnership with Communitech and community partners.	NA	NA	NA
R6	Outputs	<ul style="list-style-type: none"> • All WRDSB secondary schools engaged • Digital Repository of Equity and Inclusion Resources developed and populated • Training materials developed • Online tracking tool to share learnings developed 			

R6	A	Percentage of students with increased awareness of racism and the systemic barriers to equity.	Self-report pre- and post- sessions, WRDSB	NA	NA
R6	B	Percentage of educators with increased awareness of racism and the systemic barriers to equity.	Self-report pre- and post- sessions, WRDSB	NA	NA
R6	C	Number of reported incidents of racist behaviours and microaggressions in schools.	Number of reported incidents, WRDSB	NA	NA
R7	Outputs	<ul style="list-style-type: none"> Criteria for CFCl designation established with UNICEF Canada and other interested communities Phase 1 implementation plan finalized CFCl scaled across Canada 			
R7	A-C	To be developed in partnership with UNICEF Canada and CYPT.	NA	NA	NA



Appendix C

Confidential Annex

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Appendix C

1. Confirmation of Engagement with IPC

Appendix C

From: [Shannon McIntyre](#)
To: [Monika Bodemer](#)
Subject: FW: Confirmation of engagement
Date: Wednesday, February 27, 2019 10:50:59 AM

From: Jennifer Rees-Jones [mailto:Jennifer.Rees-Jones@ipc.on.ca]
Sent: Friday, February 22, 2019 4:39 PM
To: Shannon McIntyre <ShMcIntyre@regionofwaterloo.ca>
Subject: Confirmation of engagement

Hello Shannon,

This is to confirm that the Smart Waterloo Region has consulted with our office. Thank you for providing the draft Preliminary Privacy Impact Assessment and related documents, and for making revisions based on our feedback.

Regards,

Jennifer Rees-Jones
Senior Policy Advisor
Office of the Information and Privacy Commissioner/Ontario

(416) 326-3876
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2. PPIA

Appendix C



Information
Management
and Archives

Smart Waterloo Region Preliminary Privacy Impact Assessment

Purpose of the Preliminary PIA:

Smart Waterloo Region (SWR) has completed a Preliminary Privacy Impact Assessment (PIA) to identify if a full privacy impact assessment is required. The PIA will offer recommendations to mitigate privacy risks.

Part 1

1. Initiative

Initiative Title	Waterloo Region's <i>Smart Cities Challenge</i> Proposal
Program	Smart Waterloo Region
Business Owner¹	Matthew Chandy, Manager, Economic Development & Smart Waterloo Region Lead
Executive Sponsor	Rod Regier, Commissioner, Planning, Development & Legislative Services

2. Contact Information

Name and Title	Shannon McIntyre, Social Planning Associate, Smart Waterloo Region
Phone Number	519-575-4400 x3661
E-mail	shmccintyre@regionofwaterloo.ca

3. Description – Smart Waterloo Region Overview

Waterloo Region is a finalist in Infrastructure Canada's *Smart Cities Challenge* in the \$50 million prize category. The Smart Cities Challenge is a competition open to all municipalities, local or regional governments, and Indigenous communities (First

¹ Business Owner means any program director or equivalent having authority and accountability for business activities and business records related to those activities.

Nations, Inuit, and Métis) across Canada to achieve meaningful outcomes for residents by leveraging data and technology.

Through the *Smart Cities Challenge*, Smart Waterloo Region (SWR) is focused on improving the well-being of children and youth in Waterloo Region by leveraging the fundamental benefits that data and connected technology have to offer:

- **Openness:** When communities make their data truly accessible, usable and barrier-free, their decision-making processes become transparent, empowering citizens and strengthening the relationship between residents and public organizations.
- **Integration:** Data and connected technology empower communities to break down silos that exist within local governments and public organizations.
- **Transferability:** When tools and technological approaches are open-source, transparent and standardized, they can be used by communities across the country, no matter their size or capacity.
- **Collaboration:** Connected technology enables communities to bring traditional and non-traditional partners together to collaborate

The Smart Waterloo Region proposal outlines the approach, tech and data solutions and the outcomes expected to be achieved through implementation. Certain Chapters of the proposal are especially relevant to the PPIA:

- Chapter 4: Technology- and Data-Enabled Solutions
- Chapter 5: Data Security and Privacy
- Chapter 6: Performance Measurement
- Chapter 7: Governance

3.1. Smart Waterloo Region Data Collaborative Overview

At the centre of SWR is a community-based data platform – the Smart Waterloo Region Data Collaborative (SWR Data Collaborative). Given the SWR Data Collaborative is a foundational initiative for SWR extra attention has been given to the SWR Data Collaborative in the PPIA process.

While strong partnerships have allowed organizations in Waterloo Region to work together on key initiatives and challenges facing our children and youth, the development of an integrated database has remained a missing component in our collaborative efforts. Through the SWR consultation process, it was identified there are multiple databases housed and managed by different organizations across Waterloo Region. For various reasons, including data privacy, organizations have struggled to share this data with each other, limiting our community's ability to identify and address child and youth well-being challenges.

By de-identifying data sets through aggregation and removing variables, and combining the non-identifying data sets in one platform the SWR Data Collaborative, will allow our community to track and monitor the well-being of children and youth and will support evidence-informed decision-making and problem solving. The SWR Data Collaborative will allow Authorized Users to store, share and analyze data in a secure platform, accounting for all privacy and security needs through effective governance and privacy safeguards. The SWR Data Collaborative will be closed to Authorized Users only, with specific requirements to access.

SWR will develop agreements with Data Custodians² and Authorized Users outlining the data and information that will be shared and all privacy and security requirements, including de-identification, and authorized use of the data.

The first phase of the SWR Data Collaborative includes 5 data sets. As the collaborative expands, it is likely that more data sets will be considered for inclusion in the collaborative. Research and literature will be used by the SWR Data Security and Privacy Committee (DSPC) to recommend which data sets and variables could be included. The SWR team will work with Data Custodians of prospective data sets to facilitate inclusion of those data sets in the collaborative platform in a way that meets all necessary contractual, privacy and security requirements. There will be specific requirements related to storage, use, reporting, retention, and disposal of data within the platform.

Refer to Chapter 4 for more information about the SWR Data Collaborative.

3.2. Data and Data Sources

All the data proposed to be used, collected, analyzed, and reported as part of SWR implementation is outlined in the attached document – *Smart Waterloo Region Data and Data Sources*. The data sources and variables are identified as well as the legislative authority and rationale for including the data as part of the SWR initiative.

The five data sources included in the SWR Data Collaborative are identified. For the SWR Data Collaborative the following process was completed to de-identify the data:

- Using a research-focused lens, the SWR DSPC, with support of the Data Custodians, selected which variables from the data sets would be included in the Data Collaborative. Only variables related to factors impacting early childhood development were included in the Data Collaborative.

² Data Custodian - A Data Custodian refers to the individual responsible for, or the individual with administrative control over, granting access to a data set. In some cases, the Data Custodian has a Data Sharing Agreement with the data owner. In other cases, the Data Owner and the Data Custodian may be the same.

- For example, one variable in the EDI data set reports if a child is currently getting an assessment. This variable, and several others, were not included in the Data Collaborative.
- Only the respective Data Custodian has access to the full data set and completes the data de-identification process on behalf of the DSPC.
- Using the original data sets, the Data Custodian added a variable called “ADA” (Aggregated Dissemination Area), which is a Census Canada Geography³. For each record in the data set, the Data Custodian identified the ADA value for that record using Geographic Information System software using the address and/or postal code variable from each record.
- Using the “ADA” variable, the Data Custodian aggregated the relevant variables from the original data sets. The process of aggregating the data involved calculating the “average score” or “per cent” of relevant variables and values.

Two examples:

1. For the 2015 EDI data set, the original variable “Physical Wellbeing Domain Score” was aggregated to “Average Physical Wellbeing Domain Score” for each ADA group. This was done by calculating the average of all the record level values for that variable for each ADA. ADA groups were suppressed if they had less than ten records.
 2. For the 2015 EDI data set, the original variable “Scored Low on the Physical Wellbeing Domain” was aggregated to “Per cent that Scored Low on the Physical Wellbeing Domain”. This was done by calculating the per cent of records in an ADA that scored low on the Physical Wellbeing Domain. ADA groups were suppressed if they had less than ten records.
- A new, separate Microsoft Excel file was created to hold the aggregated data set.
 - The aggregated data was copied into the new file, with any ADA groups with less than six or ten records suppressed (depending on the requirements of the data set). No record-level and no personal information was copied into the new file that no personal information can be derived from the data sets. The record count for each ADA was also not included in the data set.
 - Only the new aggregated data set was shared with Authorized Users. The data sets were shared via encrypted and password protected Secure File Transfer Protocol (SFTP).

³ Definition of Aggregated Dissemination Area: The ADAs cover the entire country and, where possible, have a population count between 5,000 and 15,000 people. ADAs respect provincial, territorial, census division (CD), census metropolitan area (CMA) and census agglomeration (CA) with census tract (CT) boundaries in effect for the 2016 Census. ADAs are based on one of three (3) existing 2016 census dissemination geographic areas: census tracts (CTs), Census subdivisions (CSDs) or dissemination areas (DAs). (<https://www12.statcan.gc.ca/census-recensement/2016/ref/dict/geo053-eng.cfm>)

- Authorized Users are required to sign the SWR Data Collaborative Memorandum of Understanding (attached)

3.3. Designing a Major New Program or Service

	Yes	No	Unknown
Are you designing a major new program or service?	X		
Are you changing from a manual service delivery process to an electronic service delivery process?		X	
Is an existing program being redesigned to collect a significant amount of additional information?		X	
Is an existing program being redesigned with significant new uses or disclosures of information?	X		
Is an existing program being redesigned to expand access by staff to information?	X		
Is an existing program being redesigned with new or amended methods of handling information which may increase the risk of a data breach or lapse in data security?	X		

- Cloud service provider will be ISO 270001 certified, hosted in Canada.
- Provider may be the Region of Waterloo or another provider selected through a procurement process.

The SWR Data Collaborative will be hosted in Canada by the Region of Waterloo (or a host selected through a procurement process). A Request for Proposal process will be undertaken to select the platform, which would include the following policy.

Hosted solutions should maintain all data in a certified ISO27001/27017, SOC2 Type 2 datacentre located within North America (preferably within Canada). Attestations for these certifications should be available upon request. In a fully managed solution the bidders who hold a SOC2 Type 2 in their Managed Services are preferred. All data is to remain property of the Region of Waterloo, must be available through both direct and indirect processes (APIs), must be secure, should be available 99.99% of the time, should have disaster recovery processes in place and should have fully redundant backup copies including processes to ensure business continuity. By no means should any Region of Waterloo data be shared with another party without the expressed approval of the Region.

The Region requires the ability to bring the data back to the Region with verification that all external copies have been destroyed.

The data and information collected as part of Performance Measurement (Chapter 2) will be stored on the Region of Waterloo's secure Electronic Document Management System.

3.4 Technology-Related Characteristics

	Yes	No	Unknown
Involves technology designed to monitor, track or observe an individual or their transactions, for example, video cameras, cell phones and geospatial or location-based services		X	
Involves logging information, usage or preferences, for example, IP addresses, traffic data, access or transaction logs, cookies, or other mechanisms for recording an individual's use of technology		X	
Involves public-facing Internet communications, services or transactions, including web analytics, social media analytics, or business intelligence tools		X	
Involves processing or storing of information in a virtual environment, for example, cloud computing - non-personal information only	X		
Involves acquiring, or customizing, commercial software, hardware or IT support services "in-house"	X		
Involves creating information systems or other types of IT applications that will be populated by others, for example, clients of system or services will supply information		X	
Involves a system or application that will automatically collect, use, disclose or retain information		X	
Other (Please explain below)	X		
Sharing existing de-identification data sets with Authorized Users from other departments and organizations to collaborate on analysis using multiple sets of data. All data included in the SWR Data Collaborative will be aggregated to the ADA.			

For the SWR Data Collaborative

- Authorized Users of the SWR Data Collaborative will be required to follow requirements outlined in the SWR Data Collaborative MOU (attached)
- As described above, the data shared with Authorized Users in the SWR Data Collaborative will be aggregated by the Data Custodian.
- The safe storage, use, disclosure, and transfer of data is outlined in the SWR Data Collaborative MOU (attached)

4. Data Collection, Use and Disclosure

4.1. Data Involved in the Program, Service or System Resulting from SWR

	Yes	No	Unknown
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Information about individuals acting in their personal capacity (See note in line below).		X	
Information about individuals acting in their business , professional, or official capacity (e.g. name, job title, business contact information)		X	
Information that would be considered confidential (e.g. financial, policy development, legal privilege).		X	
Information about organizations (e.g. hospitals, long-term care facilities, public health unit)		X	
Aggregated, anonymized or otherwise de-identified ⁴ information (Please outline in the row below the process for how de-identification is accomplished).	X		
Refer to Data Table for data and data sources. The process for how the de-identification is accomplished is outlined in Section 3.2.			
Will previously separate information be linked? Linking information can increase the potential of being able to identify an individual, even if the information itself is not considered personal information (Please outline in the row below the process for linking).	X		
Data will be analyzed using a similar geography - ADA. Individuals can not and will not be linked. Aggregations of less than 6 or 10, depending on the data set, will be suppressed.			

4.4. Data Flow

A Data Flow diagram for the SWR Data Collaborative is attached. A data flow diagram is not required for the Performance Measurement Plan.

Part 2

5. Privacy Legislation

5.1 Applicable Privacy Legislation

	Yes	No	Unknown
Municipal Freedom of Information and Protection of Privacy Act	X		
Personal Health Information Protection Act	X		
Personal Information Protection and Electronic Documents Act	X		
Other (please identify relevant statutes in row below)		X	

⁴ De-identify means to remove any information that explicitly identifies an individual, as well as any information that either alone or with other information could be used to identify an individual.

None – not covered by privacy legislation (please explain in row below)			
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5.2 Public Records and Excluded Personal Information

	Yes	No	Unknown
Identify any personal information or personal health information that will be maintained for the purpose of creating a record that is available to the general public. What is the type of personal information, and why and how is it made available to the general public? (Please explain in row below.)		X	
Identify any personal information that will be excluded from the application of the acts by section 52 of MFIPPA. What is the type of personal information and why it is excluded? (Please explain in row below.)		X	

6. Data Subject

Identify whom the information will relate to (check all that apply).

	Yes	No	Unknown
General public	X		
Clients	X		
Regional staff		X	
Others (please describe in row below)		X	

Part 3

7. Partners/Service Providers

SWR will be a delegated authority of the Regional Municipality of Waterloo, and as such will be required to comply with all of the policies and procedures of the Region including the following Access to Information and Privacy Policies:

- Information Access and Privacy Policy
- Access and Privacy Roles and Responsibilities
- Freedom of Information Request Procedure
- Requests for Information Correction Procedure
- Privacy Complaint Procedure
- Privacy Breach Procedure
- Privacy Impact Assessment Procedure

7.1. Organizations Involved in SWR

The SWR partners/organizations are outlined in Chapter 7: Governance.

7.2. Organizations that will Collect, Use, Disclose, Retain, Store or Dispose of Information on Behalf of SWR

Data Collaborative: For Phase 2, the following organizations are Authorized Users of the SWR Data Collaborative. Authorized Users were required required to sign MOU before gaining access to the Data Collaborative.

Regional Programs	Other Public Sector Organizations	Other Organizations
<ul style="list-style-type: none">• SWR• Children's Service (CSD)• Epidemiology and Health Analytics (PHE)• Child and Family Health (PHE)• GIS (ITS)	<ul style="list-style-type: none">• City of Kitchener	<ul style="list-style-type: none">• Terrene Technology Inc.

Performance Measurement: Any partner/organization delivering/providing a service on behalf of SWR (or through SWR funding) will be required to follow the relevant privacy policies and/or legislation as a condition of their funding.

7.3. Identify any location outside of Ontario where information may be retained or stored.

All SWR data will be retained and stored in Canada.

7.4 Identify how service providers will be bound to follow relevant privacy and security requirements (check all that apply)

	In Place	Being Developed	Unknown
Contracts			
Memoranda of Understanding	X		
Agreements			
Other (please explain in row below)			

8. Consultation

Identify with whom you have consulted regarding the privacy implications of your initiative.

	Yes	No	Unknown
Information Management & Archives	X		
PHE Central Resources		X	
Research and Ethics Board		X	
Legal Services	X		
Information Technology Services	X		
Other (please identify in row below)	X		
- Information and Privacy Commissioner of Ontario			

9. Stakeholders

9.1. Indicate if you anticipate a negative reaction to your initiative from the following.

	Yes	No	Unknown
Public		X	
Regional staff		X	
Stakeholders		X	
Clients or end-users		X	
Media		X	
Other (please specify in row below)		X	

Part 4

10. PIA Activities

Describe PIA activities (check all that apply)



	Yes	No	Unknown
Completed PPIA process	X		
Completed PIA process		X	
Updating previous PIA documents related to initiative		X	
Planning to continue PIA process	X		
Engaging external consultants to complete PIA process	X		
Not planning to continue PIA process (please explain why in row below)		X	

11. Threat Risk Assessment Activities

Describe TRA activities (check all that apply).

	Yes	No	Unknown
TRA completed		X	
Planning to engage external consultants to complete TRA	X		
Updating previous TRA related to initiative		X	
Not planning to do TRA (please explain why in row below):		X	
A TRA was not completed as part of the PPIA process. However, for implementation a TRA will be completed.			

Reviewed by

	Signature	Title	Date
Business Owner		Manager, Economic Development	2019/03/01
Principle Investigator		Manager, Information Management & Archives	2019/03/01

Assessment

Y/N

1	Data collection/use/disclosure complies with legal authorities?	Y
2	Data sources, data elements, and data flow(s) documented?	Y
3	Based on assessment and follow-up questions is a full PIA necessary?	Y

A thorough PPIA has been conducted for the SWR proposal submission to Infrastructure Canada's *Smart Cities Challenge*.

They have assessed whether they have a consistent purpose and consent to use existing data sets related to child and youth wellbeing. Each data set has been cleaned to limit the fields only to those that are informative to the purpose of the Data Collaborative and have been aggregated to the ADA with a minimum of 6 to 10 cases according to data sharing agreements. Where a data set doesn't meet these requirements it has not been selected for use in the Data Collaborative.

A MOU has been developed to ensure Authorized Users of the SWR Data Collaborative (Phase 2) are following consistent use, handling, disclosure, retention, security, and destruction practices in order to protect the data sets from authorized access, as well as, loss or theft.

SWR is in the process of developing an electronic platform to securely store, share, and analyse the data sets. As such, a full PIA and TRA are required to determine if this new platform meets technical privacy requirements. Some technical privacy best practices to develop into the platform include:

- Audit log of all system changes/searches

- Audit logs maintained to identify and review usage patterns; supports proactive and reactive auditing based on triggered events (privacy audits)
- Ability to create audit reports
- Ability to restrict access to data based on user rights/roles
- Unique user IDs
- User name and password required to access system
- Ability to force password changes every 45 days and set password criteria e.g. 10 characters in length, includes 1 uppercase and/or special symbol and/or number, and locks after 3 attempts
- Ability to apply records retention schedule to permanently delete or archive data as required
- SSL for establishing an encrypted link between a web server and browser
- Encryption for data at rest

For any technology and data enabled solution identified and proposed to be implemented (outlined in Chapter 4), a PPIA will be completed to assess whether or not a PIA is required. If a PIA is required, SWR will do so with the support of the DSPC and the Region of Waterloo.

It is recommended that the PIA analyse best practices and recommendations from the October 23, 2018 International Conference of Data Protection & Privacy Commissioners Resolution on E-Learning Platforms. The De-Identification Guidelines for Structure Data published by the Information and Privacy Commissioner of Ontario in June 2016 should also be used to inform the PIA recommendations.

As recommended, as part of implementation, SWR will engage the expertise of a de-identification expert to vet the de-identification method and to ensure that the data sets used in the SWR Data Collaborative cannot be linked back together in order to render identifiable personal information or personal health information.

As part of implementation, SWR will consult with the Region of Waterloo's Ethics Board to explore if this project meets the ethics review requirements. An ethics review will be completed if recommended by the Region's Ethics Review Board.

This initiative will proceed to the full PIA stage.

3. Data Flows

Appendix C

Smart Waterloo Region Data Sets

The following tables identifies the data SWR will use to measure progress for ongoing evaluation of specific activities and SWR overall, as well as to better understand the well-being of children and youth. Data sets included in the SWR Data Collaborative are identified by an asterisks (*).

For all outcome indicators and data yet to be determined, SWR will ensure SWR and partners have the legal authority to collect and use the data or information as part of the PIA process.

1. Early Development Instrument (EDI)*

Data Source	The EDI is collected by the Offord Centre for Child Studies at McMaster University and owned by the Ministry of Education.
Variables	<p>The following variables from 2010 and 2015 will be included:</p> <ul style="list-style-type: none"> • Sex – per cent male • Aggregated Dissemination Area (ADA) • Per cent English as a second language/French as a second language • Average Physical Well-being score and per cent that score low • Average Language and Cognitive development score and per cent that score low • Average Social Competence score and per cent that scored low • Average Emotional maturity score and per cent that score low • Average Communication and General Knowledge score and per cent that score low • Per cent vulnerable in one or more domain
Legal Authority	<p>Legislative Authority</p> <ul style="list-style-type: none"> • Under the Child Care and Early Years Act, 2014 71(1) <p>A prescribed local authority may collect personal information, directly or indirectly, for purposes related to the following matters, and may use it for those purposes:</p> <ol style="list-style-type: none"> 1. With respect to child care and early years programs and services that the service system manager, First Nation or prescribed local authority establishes, administers, operates or funds, in whole or in part, <ol style="list-style-type: none"> i. planning, delivering, evaluating and monitoring the programs and services, ii. allocating resources to the programs and services, and

	<p>iii. detecting, monitoring and preventing fraud and the unauthorized receipt of services and benefits related to the funding.</p> <p>Applicable Agreement</p> <ul style="list-style-type: none"> • The Ministry of Education shares the data with Children's Services, Region of Waterloo to use the data to inform effective program and community planning using evidence. • There is a Memorandum of Understanding concerning the Release of Information Collected Using the Early Development Instrument (Cycle 4) From Ontario Ministry of Education to Regional Municipality of Waterloo for Purposes Under the Child Care and Early Years Act, 2014 (CCEYA, 2014) • The Ministry of Education confirmed that third parties can be made authorized users of the EDI data through an MOU between the Region and the third party that requiring the third party following the same requirements as the Region under it's MOU with the Ministry. <p>Privacy Legislation</p> <ul style="list-style-type: none"> • Freedom of Information and Protection of Privacy Act (FIPPA) • Municipal Freedom of Information and Protection of Privacy Act (MFIPPA)
Aggregation/De-Identification	<ul style="list-style-type: none"> • Children's Services, Region of Waterloo de-identifies the data set by removing all PI and irrelevant variables. Using Postal code values, the data is then grouped into Aggregated Dissemination Areas (ADA) by calculating the "average score" or "per cent" of relevant variables and values. • Each group must contain a minimum of 10 records to be included in the data set that is included in the collaborative platform. • No identifiers are included in the data set. No personal information is disclosed to anyone. Data only available in the platform at aggregated groups greater than 10 cases.
Method	<ul style="list-style-type: none"> • Kindergarten teachers complete the questionnaire (paper survey) about the child, based on the teacher's knowledge. • The data set that is included in the data collaborative is made available in a Microsoft Excel spreadsheet. The spreadsheet contains only aggregated values (average score or per cent) for each ADA group.
Rationale	<ul style="list-style-type: none"> • The EDI data a comprehensive data set collected in Waterloo Region related to early childhood development. • Two of the variables are found in the Canadian Index for Child and Youth Well-being, as such as part of the long-term outcomes measured. • By collaborating with partners to analyze the data in new ways, using additional data sets, we will be able to gain new insights that will inform innovative ways of viewing and addressing child development challenges in Waterloo Region.

2. Kindergarten Parent Survey (KPS)*

Data Source	Offord Centre collects and owns the data. The Offord Centre provides the data to Children's Services, Region of Waterloo.
Variables	<p>The following variables from 2015 will be included:</p> <ul style="list-style-type: none"> • ADA • Per cent with Access to Family Doctor • Per cent that have concerns about child • Per cent who have accessed to food services • Per cent overweight/obese using Body Mass Index (BMI) • Per cent underweight using BMI • Per cent with less than 11 hours of sleep • Per cent eating breakfast everyday • Per cent eating meals with family everyday • Per cent that accessed services and those that could not find services • Per cent with more than 2 hours Screen time on average • Average Social Cohesion Index • Per cent speaking other language at home (other than French or English) • Per cent Lone-parent family • Per cent First Nation, Metis, Inuit • Per cent Immigration • Per cent Educational attainment of parent/guardian • Per cent without disposable income • Per cent on social assistance <p>The following variables will be used for Performance Measurement, not included in the Data Collaborative:</p> <ul style="list-style-type: none"> • Per cent of children participating in a physical activity once a week or more

	<ul style="list-style-type: none"> Per cent of children who have participated in physical activity or sport in the last 12 months
Legal Authority	<p>Legislated Authority</p> <ul style="list-style-type: none"> Under the CCEYA, 2014 71(1) <p>Applicable Agreement</p> <ul style="list-style-type: none"> Data Sharing Agreement between McMaster University and Region of Waterloo (Attached) The Offord Centre confirmed that third parties can be made authorized users of the KPS data through an MOU requiring the third party follow the same requirements as the Region under its Data Sharing Agreement with the Offord Center. <p>Privacy Legislation</p> <ul style="list-style-type: none"> FIPPA MFIPPA
Aggregation/De-identification	<ul style="list-style-type: none"> Children's Services, Region of Waterloo de-identifies the data set by removing all PI and irrelevant variables. Using Postal code values, the data is, then grouped into Aggregated Dissemination Areas (ADA) by calculating the "average score" or "per cent" of relevant variables and values. Each group must contain a minimum of 10 records to be included in the data set that is included in the collaborative platform. No identifiers are included in the data set. No personal information is disclosed to anyone. Data only available in the platform at aggregated groups greater than 10 cases.
Method	<ul style="list-style-type: none"> Electronic survey completed by parents. The data set that is included in the data collaborative is made available in a Microsoft Excel spreadsheet. The spreadsheet contains only aggregated values (average score or per cent) for each ADA group.
Rationale	<ul style="list-style-type: none"> The KPS data a comprehensive data set collected in Waterloo Region related to early childhood development. Social Cohesion Index is one the variables used as a proxy for the Canadian Index for Child and Youth Well-being, as such as part of the long-term outcomes measured. By collaborating with partners to analyze the data in new ways, using additional data sets, we will be able to gain new insights that will inform innovative ways of viewing and addressing child development challenges in Waterloo Region.

3. Licensed Child Care Centre Data (ELCC)*

Data Source	Secondary data downloaded from the publicly available Ministry of Education's Child Care Licensing System (CCLS)
Variables	<p>The following variables from 2015 will be included:</p> <ul style="list-style-type: none"> • ADA • Number of licensed child care centres • Number of licensed child care spaces
Legal Authority	<p>Legislated Authority</p> <ul style="list-style-type: none"> • Under the CCEYA, 2014 71(1) <p>Publicly available data: https://www.iaccess.gov.on.ca/LCCWeb/childcare/search.xhtml</p> <p>Privacy Legislation</p> <ul style="list-style-type: none"> • MFIPPA
Aggregation/De-Identification	Not applicable, no personal information.
Method	<ul style="list-style-type: none"> • Secondary data downloaded from the publicly available Ministry of Education's CCLS • Data is aggregated to the ADA using address and postal values.
Rationale	<ul style="list-style-type: none"> • Access to early learning is an identified factor affecting healthy child development. • This data set can identify availability of child care centres to analyze in conjunction with other sets of data.

4. Healthy Babies, Healthy Children*

Data Source	<ul style="list-style-type: none"> • The Child and Family Health (CFH) Division of the Region of Waterloo Public Health and Emergency Services (ROWPHE) collect and own HBHC Screen data.
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Variables	<p>The following variables from 2014 -2018 will be included:</p> <ul style="list-style-type: none"> ● Per cent of screens with 2 or more yes' (this is a "with risk" screen)-broken down by all stages (prenatal, postpartum and early childhood) ● Per cent of screens with 2 or more yes' and then go on to have a confirmed risk IDA (broken down by all stages) ● Per cent of screens with 2 or more yes' that then go onto home visiting services (broken down by all stages) ● Per cent Client has concerns about money to pay for housing/rent, and family's food, clothing, utilities and other basic necessities ● Per cent Mother did not complete high school ● Per cent Multiple birth ● Per cent Premature ● Per cent Health conditions/medical complications during pregnancy that impact infant ● Per cent Complications during labour and delivery ● Per cent Maternal smoking of cigarettes during pregnancy ● Per cent Maternal alcohol use during pregnancy ● Per cent Maternal drug use during pregnancy ● Per cent Maternal separation from infant greater than 5 days ● Per cent Was the birth weight less than 1500g ● Per cent Was the birth weight more than 4000g ● Per cent Birth Weight ● Per cent Congenital or acquired health challenge ● Per cent Parent(s) identified a risk factor ● Per cent Mother experienced a previous loss ● Per cent Client or parenting partner has a history of depression, anxiety, or other mental illness ● Per cent Feeding ● Per cent Vaginal Birth Type ● Per cent Caesarian Birth Type ● Per cent Gestation ● Per cent Gravida ● Per cent Parity ● Per cent HBHC Screening Stage ● Per cent No prenatal care before sixth month ● Per cent Mother is less than 18 years old ● Per cent Mother was less than 18 years old when first child was born
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	<ul style="list-style-type: none"> ● Per cent Mother is a single parent ● Per cent Mother and/or child do not have a designated primary care provider ● Per cent Client expresses concern about their ability to parent baby/child ● Per cent Client expresses concern about their ability to care for baby/child ● Per cent Client cannot identify support person to assist with parenting of the baby/child ● Per cent Client cannot identify support person to assist with care of the baby/child ● Per cent Client or family in need of newcomer support ● Per cent Client or partner has a disability that may impact parenting ● Per cent Client's relationship with parenting partner is strained ● Per cent Client of parenting partner has been involved with Child Protection Services as a parent ● Per cent Client's response patterns are inconsistent or inappropriate to the baby's/child's cues ● Per cent Health care professional has concerns about the wellbeing of client and/or baby/child
Legal Authority	<p>Legislated Authority</p> <ul style="list-style-type: none"> ● Health Protection and Promotion Act, 7 (1) The Minister may publish public health standards for the provision of mandatory health programs and services and every board of health shall comply with them. 2017, c. 25, Sched. 3, s. 4 (1). <p>Applicable Agreements:</p> <ul style="list-style-type: none"> ● CFH has a service agreement with Cambridge Memorial Hospital, Grand River Hospital, and midwife practices. ● CFH has a protocol with Family and Children's Services. ROWPHE screening partners screen their prenatal clients for HBHC and we do not have a service agreement with them, they are part of the same Health Information Custodian and circle of care. ● Director, Child and Family Health, Public Health confirmed that third parties can be made authorized users of the HBHC data. <p>Privacy Legislation</p> <ul style="list-style-type: none"> ● PHIPA ● MFIPPA
Aggregation/De-Identification	<ul style="list-style-type: none"> ● At an aggregated level, with data values based on case counts of 1 to 5 suppressed (zeros or values 6+ will be released). This level of suppression is not explicitly required for ISCIS, but is in alignment with suppression levels required for the BORN data for privacy purposes.
Method	<ul style="list-style-type: none"> ● Data for the HBHC Screen is primarily collected by screening partners of CFH. These include: Grand River Hospital Nurses, Cambridge Memorial Hospital Nurses, Midwives, Call Response Public Health Nurses, Prenatal Nutrition Program, Family and Children Services, Nurse Practitioners,

	<p>and on occasion: Sanctuary Refugee Health Centre, Haven House, Anselma House. Occasionally, Public Health Nurses in the HBHC program will complete an HBHC Screen.</p> <ul style="list-style-type: none"> • Questions are asked by the screening partners and recorded on the HBHC Screen. Some screening partners record the information in the BORN Information System.
Rationale	<ul style="list-style-type: none"> • The HBHC Screen was reviewed and indicators of interest were identified if they related, or are a proxy measure, to factors that influence early child development. • Analyzing these indicators alongside other local data sets will allow for a more comprehensive examination of early child development in Waterloo Region.

5. Census (2016)*

Data Source	<ul style="list-style-type: none"> • Collected by Statistics Canada
Variables	<p>The following variables from 2016 will be included in the SWR Data Collaborative:</p> <ul style="list-style-type: none"> • ADA • Per cent 0-6 that identify as aboriginal. • Per cent 0-6 that are immigrants • Per cent 0-6 that identify as being a visible minority • Per cent 0-6 that are in a household with income below the LICO-AT
Legal Authority	<ul style="list-style-type: none"> • Publically available data.
Aggregation/De-Identification	<ul style="list-style-type: none"> • Not applicable, no personal information.
Method	<ul style="list-style-type: none"> • Publicly available data downloaded through the Community Data Program.
Rationale	<ul style="list-style-type: none"> • Recent data for indicators that have been shown to be related to poor child development.

6. Canadian Community Health Survey

Data Source	<ul style="list-style-type: none"> Collected by Statistics Canada
Variables	<p>The following variables will be included:</p> <ul style="list-style-type: none"> Percentage of youth, 12 to 17, having positive self-rated mental health Percentage of youth, 12 to 17, with a “very strong” or “somewhat strong” sense of belonging to their local community Percentage of youth (12 to 17) who have seen or talked to a mental health professional about their emotional or mental health in the past 12 months Percentage of youth who report experiencing difficulties getting health information or advice Percentage of youth (12 to 17) who reported having a barrier to improving their health Percentage of youth (12 -17) who are meeting the Canadian Physical Activity Guidelines Percentage of youth (12-17) who feel confident to think or express their own ideas and opinions every day or almost every day in the past month
Legal Authority	<ul style="list-style-type: none"> Data shared by Ministry of Health and Long-Term Care to Ontario public health units, including Region of Waterloo Public Health, for the purposes of fulfilling their requirements for population health assessment under the Ontario Public Health Standards, 2018
Aggregation/De-Identification	<ul style="list-style-type: none"> The data will be analyzed and shared by ROWPHE Region-wide averages
Method	<ul style="list-style-type: none"> Ontario CCHS Share File data are analyzed by Public Health staff using the bootstrapping method and in alignment with Statistics Canada’s analytic guidelines. Releasable results are shared with SWR team.
Rationale	<ul style="list-style-type: none"> Recent data for indicators that have been shown to be related to child and youth well-being.

7. Education Quality and Accountability Office (EQAO)

Data Source	<ul style="list-style-type: none"> EQAO conducts province-wide tests annually. Students attending publicly funded elementary and secondary schools in Ontario are required to take the respective tests at their grade level (Grade 3, 6, 9 and 10)
Variables	<p>The following variables will be included:</p> <ul style="list-style-type: none"> Per cent of Eligible Students, fully participating in the Grade 3 EQAO, meeting provincial standard (Grade 3) Per cent of Eligible Students, fully participating in the OSSLT, Successful (Grade 10)

Legal Authority	Legislative Authority to collect <ul style="list-style-type: none"> Education Quality and Accountability Office Act, 1996, S.O. 1996, c. 11 s9(6) Privacy Legislation <ul style="list-style-type: none"> FIPPA MFIPPA
Aggregation/De-Identification	<ul style="list-style-type: none"> Access to EQAO data files through the EQAO Data Portal. Access is limited to files containing information from which names, Ontario Education Numbers and other personal identifiers have been removed. The minimum number of participating students for publication of achievement results is 10. The minimum number of respondents for the release of questionnaire results is six. SWR will only report region-wide results (average)
Method	<ul style="list-style-type: none"> Students attending publicly funded elementary and secondary schools in Ontario take the respective tests at their grade level (Grade 3, 6, 9 and 10) annually Data is access through EQAO's data portal (Region of Waterloo is an authorized user), data are analyzed by SWR staff in alignment with EQAO guidelines.
Rationale	<ul style="list-style-type: none"> Data can be used in combination with other important information, such as demographic information, to help improve student learning and achievement, identify areas of strength and areas for improvement in reading, writing and math programs. .

8. Ministry of Education

Data Source	<ul style="list-style-type: none"> Ministry of Education School Board Progress Reports
Variables	The following variables will be included: <ul style="list-style-type: none"> Per cent of students who receive a diploma within 5 years of starting high school
Legal Authority	Legislative Authority to collect <ul style="list-style-type: none"> Education Act, s8.1

	Privacy Legislation <ul style="list-style-type: none"> • FIPPA • MFIPPA
Aggregation/De-Identification	<ul style="list-style-type: none"> • Publically available data via Ministry of Education Website: https://www.app.edu.gov.on.ca/eng/bpr/searchBoard.asp • SWR will only report region-wide results (average)
Rationale	<ul style="list-style-type: none"> • Data can be used in combination with other important information to help improve student well-being, learning and achievement

9. School Climate Surveys (WRDSB, WCDSB)

Data Source	Local School Boards administer school climate surveys under authority of the Education Act every 2 years
Variables	<ul style="list-style-type: none"> • To be determined with WCSDB and WRDSB
Legal Authority	Legislative Authority to Collect <ul style="list-style-type: none"> • Education Act s169.1(2.1) Privacy Legislation <ul style="list-style-type: none"> • FIPPA • MFIPPA
Aggregation/De-Identification	<ul style="list-style-type: none"> • Data sets de-identified by school board data custodians and aggregated to per cent or average for relevant variables only. • Only aggregated, de-identified data sets are shared with Smart Waterloo Region.
Method	<ul style="list-style-type: none"> • School climate survey is administered by the School Boards under authority of the Education Act.
Rationale	<ul style="list-style-type: none"> • Data can be used in combination with other important information to help improve student well-being, learning and achievement

10. BORN

Data Source	
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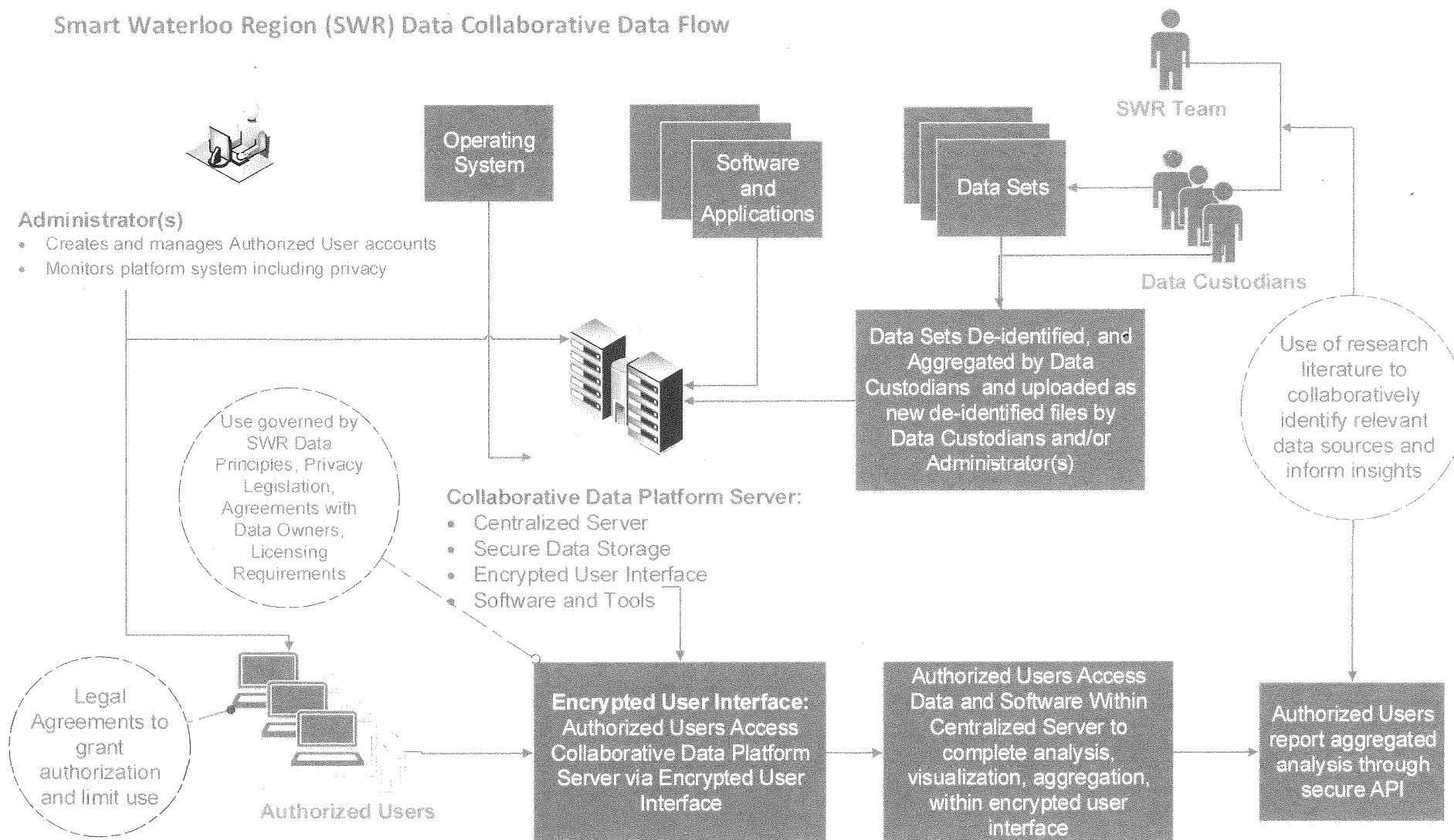
Variables	<ul style="list-style-type: none"> Percentage of singleton infants born small for gestational age (less than 10th percentile). Percentage of first-time moms who attended prenatal classes.
Legal Authority	<p>BORN Ontario is a prescribed registry (legally enforced mandatory data collection of health information) under PHIPA. Region of Waterloo Public Health and Emergency Services has access to de-identified data collected by BORN for the purpose of fulfilling requirements of the Ontario Public Health Standards (2018) as a local Board of Health.</p> <p>Legislated Authority</p> <ul style="list-style-type: none"> Health Protection and Promotion Act, 7 (1) The Minister may publish public health standards for the provision of mandatory health programs and services and every board of health shall comply with them. 2017, c. 25, Sched. 3, s. 4 (1). <p>Applicable Agreements:</p> <ul style="list-style-type: none"> Access is formally granted to ROWPHE through a BORN Public Health Data Sharing Agreement <p>Privacy Legislation</p> <ul style="list-style-type: none"> PHIPA MFIPPA
Aggregation/De-Identification	<ul style="list-style-type: none"> The Epidemiology and Health Analytics team of the ROWPHE department extracted the data from the BORN Information System public health data cubes interface and provided Region-wide averages for the variables.
Method	<p>BORN data is collected from a number of sources including:</p> <ul style="list-style-type: none"> Fertility clinics Prenatal screening laboratories Specialized antenatal clinics (information about fetal anomalies) Hospitals (pregnancy, labour, birth, and early newborn care information including NICU/SCN admissions) Midwifery groups (pregnancy, labour, birth, and early newborn care information) Newborn screening laboratories Prenatal screening and newborn screening follow-up clinics <p>Data is collected through a number of mechanisms including manual data entry and automated extraction and uploads from health record systems, where available.</p>

Rationale	<ul style="list-style-type: none"> Recent data for indicators that have been shown to be related to child and youth well-being.
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4. Data Flows Diagram

Appendix C

Smart Waterloo Region (SWR) Data Collaborative Data Flow



5. SWR Data Collaborative MOU

Appendix C

Smart Waterloo Region Data Collaborative Pilot Agreement

This Agreement made the 30th day of January, 2019.

B E T W E E N:

THE REGIONAL MUNICIPALITY OF WATERLOO
(the “**Region**”)

- and -

THE CORPORATION OF THE CITY OF KITCHENER
(the “**Authorized User**”)

WHEREAS the Office of Economic Development is a division of The Regional Municipality of Waterloo;

AND WHEREAS Digital Kitchener Innovation Lab is a division of The Corporation of the City of Kitchener;

AND WHEREAS the Office of Economic Development and the Digital Kitchener Innovation Lab desire to work together regarding the Project, as defined below, and as further detailed in the main body of this Agreement;

AND WHEREAS the Office of Economic Development has launched a project named Smart Waterloo Region (the “**Project**”) to assist with the Region’s Phase 2 application to Infrastructure Canada’s Smart Cities Challenge (the “**Smart Cities Application**”);

AND WHEREAS the Region is currently party to a Memorandum of Understanding with Her Majesty the Queen in Right of Ontario as represented by the Ministry of Education (the “**Ministry**”) dated May 24th, 2016 attached hereto as Schedule “**A**” (the “**EDI Data Agreement**”), governing the collection of Early Development Information (EDI) (the “**EDI Data**”);

AND WHEREAS the Region is also currently party to a Data Sharing Agreement with McMaster University dated April 1, 2018, attached hereto as Schedule “**B**” (the “**KPS Data Agreement**”), governing the collection of Kindergarten Parent Survey (KPS) data (the “**KPS Data**”);

AND WHEREAS Public Health, a division of The Regional Municipality of Waterloo, collects and owns data related to its Healthy Babies, Healthy Children program more particularly describes in Schedule “**C**” attached hereto (the “**HBHC Data**”);

AND WHEREAS to assist with the second phase of Region’s Smart Cities Application, the Region desires to share the EDI Data, KPS Data and HBHC Data with the Authorized User, on the terms outlined in this Agreement;

Document Number: 2913486

Version: 7

NOW THEREFORE in consideration of the mutual terms, conditions and covenants herein contained, the Region and the Authorized User each agree with each other as follows:

ARTICLE 1. DEFINITIONS.

- 1.1. **Definitions.** In this Agreement including the recitals above, the following words have the following meanings:

"Authorized User(s)" means The Corporation of the City of Kitchener who have been authorized to have access the Information by the Region.

"Data Owner" means the party identified as owning data by this Agreement, respectively the Ministry for the EDI Data; McMaster University for the KPS Data; and the Region for the HBHC Data.

"Data Set(s)" means a collection of related Information that can be accessed individually or in combination or managed as a whole by the Authorized User, as described in Appendix 1, which includes the Information but may also include third party publically available information such as Statistic Canada's Census Data.

"Derivable Personal Information" means Information that could potentially identify an individual, due to a subset of fewer than ten (10) observations, through a process of elimination, or otherwise.

"FIPPA" means the Freedom of Information and Protection of Privacy Act, R.S.O. 1990, c. F.31, as amended.

"Indemnified Parties" means:

- a) Her Majesty the Queen in right of Ontario as represented by the Minister of Education, her Ministers, directors, officers, agents, appointees, and employees;
- b) McMaster University; and
- c) the Region, its elected officials, officers, employees, volunteers, agents, contractors, and all respective heirs, administrators, executors, successors and assigns.

"Information" means all EDI Data, KPS Data, and the HBHC Data, including all Data Set elements and Data Sets, as described in Schedule C

"Intellectual Property" means any intellectual or otherwise proprietary right of any type in any form protected or protectable under the laws of Canada, any foreign country or any political subdivision of any country, including without limitation, any intellectual or proprietary rights protected or protectable by legislation, by common law or at equity.

"MFIPPA" means the Municipal Freedom of Information and Protection of Privacy Act, R.S.O. 1990, c. M.56, as amended.

"Personal Information" means recorded information about an identifiable individual or that may identify an individual.

"PHIPA" means the Personal Health Information Protection Act, 2004, S.O. 2004, c. 3, as amended

"Record"; for the purposes of the Agreement, means any recorded information, including any Personal Information, in any form: (a) provided by the Region to the Recipient, or provided by the Recipient to the Region, for the purposes of the Agreement; or (b) created by the Recipient in the performance of the Agreement.

"Report" means the final version of any written material in any format or on any media, including print, electronic and digital, produced by or on behalf of the Region that reports outcomes, results or conclusions based on or contains the Information.

ARTICLE 2. TERM.

- 2.1. This Agreement is effective from January 21, 2019 until February 15, 2019 unless otherwise terminated pursuant to Article 7.

ARTICLE 3. INFORMATION TO BE PROVIDED

- 3.1 **Information Provided by the Region.** The Region shall provide the Information to the Authorized User at the time this Agreement is signed by all parties hereto.
- 3.2 **Aggregation.** All Information from all Data Sets included in the Project will be aggregated to the Aggregated Dissemination Area, as defined by Statistics Canada and outlined in Schedule "D" attached hereto.
- 3.3 **No Promise.** There is no representation, warranty, condition or other promise of any kind, express, implied, statutory, or otherwise as to the accuracy, completeness, reliability, currency or veracity of the Information.

ARTICLE 4. USE AND DISCLOSURE OF INFORMATION.

- 4.1. The Region represents, warrants, and covenants that:
- a) it has obtained or ensured that all necessary consents have been obtained for use of the EDI Data, KPS Data, and HBHC data by the Authorized User as contemplated and permitted by this Agreement; and
 - b) the uses contemplated herein do not contravene the Region's agreements with McMaster University and Her Majesty the Queen in right of Ontario as represented by the Minister of Education attached as schedules hereto and that, where needed, the Region has obtained the appropriate amendments to such agreements to permit the sharing of such data with the Authorized User for the purposes set out herein.
- 4.2. The Authorized User represents, warrants and covenants that as an "Authorized User" (as defined in the EDI Data Agreement) under the EDI Data Agreement and as a user of the KPS Data (as defined in the KPS Data Agreement) that it shall not do anything or cause any person to cause the Region to be in violation of the EDI Data Agreement and/or the KPS Data Agreement in relation to its use of the EDI Data and/or KPS Data.
- 4.3. The Authorized User shall use the Information solely with the intent to improve the well-being of children and youth, as described in the Smart Waterloo Region Challenge Statement, outlined in Schedule "E" attached hereto, specifically to:
- a) track and/or monitor the well-being of children and youth in Waterloo Region;
 - b) analyze the Information to develop greater understanding of the factors which influence the well-being of children and youth;
 - c) inform, develop and administer policies and programs related to the well-being of children and youth in Waterloo Region ; and
 - d) support the implementation and evaluation of Smart Waterloo Region's Smart Cities proposal
- 4.4. Authorized Users shall not:
- a) use or disclose the Information for any purpose other than the purposes defined in Article 4.2;
 - b) permit any person except the Authorized User to have access to or to use or to disclose the Information;
 - c) use or disclose the Information for the purpose of identifying one or more individuals;

- d) use or disclose the Information for the purpose of individual-level student diagnosis;
 - e) identify schools or school boards using the Information;
 - f) manipulate, process, or otherwise deal with the Information in any manner or by any means that creates, renders, extracts or otherwise yields Personal Information;
 - g) store the Information on a non password-protected computer drive;
 - h) use the Information to identify any individuals from whom such Information were collected. If individual level data are linked with other data sources that provide ways of identifying students or families, this analysis will be done in a secure and confidential manner that ensures that the identities of individual respondents and children are protected;
 - i) match, merge or link the Information with other data or information to create Personal Information or Derivable Personal Information that results in identification or one or more individuals; and
 - j) report the Information when the report features fewer than ten (10) records.
- 4.5. Authorized Users shall report all results using the Information to the Region upon the expiration of the term of this Agreement or early termination of this Agreement. Using interpretation of analysis of the Information that follows accepted scientific standards and all results must be aggregated further to ensure that no child or family can be identified and that appropriate scientific standards are met. Furthermore, only group level data will be reported; schools and school boards will not be identified in any public reporting of the results in the public domain;
- 4.6. **Authorized Users.** The Authorized User shall limit access to the Information to only to designated qualified employees of the Authorized User. The Authorized User shall immediately deny access to any such employee of the Authorized Users who no longer needs the Information for the purposes outlined in Article 4.
- 4.7. **Protection of Information.** The Authorize User shall protect the Information by putting in place security arrangements, including all necessary administration, technical and physical safeguards, to ensure the confidentiality and security of the Information against such risks as unauthorized access, use or disclosure.
- 4.8. **Disclosure.** For the purpose of this section, "disclose" and "disclosure" of the Information includes any redistribution of the Information, whether for a fee or not.
- 4.9 **Third Party Information.** Despite any other provision of this Agreement, nothing herein shall limit the ability of the Authorized User to use third party publically available information such as Statistic Canada's Census Data when it has been acquired independently of this Agreement.

ARTICLE 5. INTELLECTUAL PROPERTY RIGHTS AND USE OF REPORTS.

- 5.1. **Information.** The Authorized User has no intellectual property right, title or interest in the Information. No ownership rights in or to the Information are transferred to the Authorized User this Agreement. For clarity, the Ministry for the EDI Data; McMaster University for the KPS Data and the Region for the HBHC Data reserves all of its intellectual property rights including copyright, and all other rights in and to the Information, that are not expressly granted by this Agreement.
- 5.2. **Reports.** The Authorized User shall not own any copyright or other intellectual property rights in any reports or analysis of the Information prepared by the Authorized User.
- 5.3. **No Publication.** For certainty, the Authorized User is not permitted to publish a report, and the Region shall be the only party to Publish such Report.
- 5.4. **The Organization Warranties.** The Region and the Authorized User each represent, warrant and covenant that it has, or at all material times will have, all intellectual property rights and all other rights necessary to grant every license and right granted under this Agreement, without violating or infringing the intellectual property rights or any other rights of any third-party.
- 5.5. **FIPPA, PHIPA and MFIPPA Records and Compliance.** The Authorized User and the Region acknowledge and agree that FIPPA, PHIPA and/or MFIPPA applies to and governs all Records and may require the disclosure of such Records to third parties. The Authorized User and the Region further agree that neither party shall be considered in violation of this Agreement where disclosing Records or Information as required by law or order of a body with jurisdiction. Furthermore, the Authorized User agrees:
- (a) to keep Records secure;
 - (b) to provide Records to the Region within seven (7) calendar days of being directed to do so by the Region for any reason including an access request or privacy issue;
 - (c) not to access any Personal Information unless the Region determines, in its sole discretion, that access is permitted under FIPPA and/or MFIPPA;
 - (d) not to directly or indirectly use, collect, disclose or destroy any Personal Information for any purposes that are not authorized by the Region;
 - (e) to ensure the security and integrity of Personal Information and keep it in a physically secure and separate location safe from loss, alteration,

destruction or intermingling with other records and databases and to implement, use and maintain the most appropriate products, tools, measures and procedures to do so;

- (f) to implement other specific security measures that in the reasonable opinion of the Region would improve the adequacy and effectiveness of the Authorized User's measures to ensure the security and integrity of Personal Information and Records generally; and
- (g) that any confidential information supplied to the Region may be disclosed by the Region where it is obligated to do so under FIPPA and/or MFIPPA, by an order of a court or tribunal or pursuant to a legal proceeding;

and the provisions of this paragraph shall prevail over any inconsistent provisions in the Agreement.

ARTICLE 6. DESTRUCTION OF INFORMATION.

- 6.1. **Destruction.** The Authorized User shall securely destroy the Information promptly upon termination of this Agreement.
- 6.2. **Notification.** The Authorized User shall notify the Region in writing of the secure destruction of the Information within 5 calendar days of the termination of this Agreement.

ARTICLE 7. LIABILITY, INDEMNIFICATION AND INSURANCE.

- 7.1. **Region Not Liable.** The Region shall not be liable to the Authorized User, its personnel, or any other person, for any losses, expenses, costs, damages or liabilities, or any causes of action, actions, claims, demands, lawsuits or other proceedings in any way based upon, occasioned by, attributable to, arising out of or by reason of any use of the Information by the Authorized User that is not permitted by this Agreement.
- 7.2. **Indemnification.** The Authorized User shall both during and after the term of this Agreement, at all times, and at its own cost, expense and risk, indemnify, defend and save harmless the Indemnified Parties from and against any and all losses, damages (including, but not limited to, incidental, indirect, special and consequential damages, or any loss of use, revenue or profit by any person, organization or entity), fines, penalties and surcharges, liabilities (including, but not limited to, any and all liability for damage to property and injury to persons, including death), judgments, claims, demands, causes of action, contracts, suits, actions or other proceedings of any kind (including, but not limited to proceedings

of a criminal, administrative or quasi criminal nature) and expenses (including, but not limited to, legal fees on a substantial indemnity basis), which the Indemnified Parties or Party may suffer or incur, howsoever caused, arising out of or in consequence of or directly or indirectly attributable to any unauthorized use of the Information or failure to perform in accordance with its contractual obligations under this Agreement by the Authorized User, its agents, employees and sub-consultants.

The Region, both during and after the term of this Agreement, shall at all times, and at its own cost, expense and risk, indemnify and hold harmless the Authorized User, its elected officials, officers, employees, volunteers, agents, contractors, and all respective heirs, administrators, executors, successors and assigns from any and all losses, damages (including, but not limited to, incidental, indirect, special and consequential damages, or any loss of use, revenue or profit by any person, organization or entity), fines, penalties and surcharges, liabilities (including, but not limited to, any and all liability for damage to property and injury to persons, including death), judgments, claims, demands, causes of action, contracts, suits, actions or other proceedings of any kind (including, but not limited to proceedings of a criminal, administrative or quasi criminal nature) and expenses (including, but not limited to, legal fees on a substantial indemnity basis), which the Authorized User, its elected officials, officers, employees, volunteers, agents, contractors and all respective heirs, administrators, executors, successors and assigns may suffer or incur, however caused, arising out of or in consequence of or directly or indirectly attributable to any breach by the Region of the warranty set out in section 4.1 of this Agreement.

- 7.3 **The Authorized User's Insurance.** It is the responsibility of the Authorized User and/or their Insurance Broker to review all potential operations and exposures to determine if the coverage and limits noted below are sufficient to address all insurance related exposures presented by the specifications of this the sharing of the Information described in this Agreement. The Authorized User shall insure its undertaking, business and equipment under the following coverage so as to protect and indemnify and save harmless the Region:

a.) **General Liability Insurance:** The Authorized User shall maintain liability insurance acceptable to the Region throughout the term of this Agreement. Coverage shall consist of a comprehensive policy of public liability and property damage insurance, with all applicable coverage extensions/endorsements available, in an amount of not less than \$2,000,000 per occurrence. Such insurance shall name THE REGIONAL MUNICIPALITY OF WATERLOO, MCMASTER UNIVERSITY, and HER MAJESTY THE QUEEN IN RIGHT OF ONTARIO AS REPRESENTED BY THE MINISTER OF EDUCATION, as additional insureds with a cross liability endorsement and severability of interests provision. The policy SIR/deductible shall not exceed \$100,000 per claim (unless approved by risk management) and if the policy has an aggregate limit, the

amount of the aggregate shall be double the required per occurrence limit.

b.) Technology Errors and Omissions Insurance and Network Security Coverage shall be purchased in an amount not less than \$1,000,000 per occurrence and \$1,000,000 in the aggregate. The policy shall include coverage for claims resulting from network risks such as data breaches, unauthorized access, theft of confidential information, invasion of privacy, destruction, alteration or damage to electronic information, intellectual property infringement such as copyright, trademarks, service marks and trade dress. The policy shall be renewed for 3 years after contract termination.

c.) Provisions: All Insurers must be licensed in Ontario. The Authorized User shall forward Certificates of Insurance evidencing this insurance prior to the commencement of work and thereafter on or prior to the expiry of the insurance coverage to the Region. The Certificates shall state that coverage will not be cancelled, terminated, amended or otherwise changed or modified except after thirty (30) days (fifteen (15) days if cancellation is due to non payment of premium) prior written notice by certified mail to the Region

It is also understood and agreed that in the event of a claim any deductible or self-insured retention (SIR) under these policies of insurance shall be the sole responsibility of the Vender and that this coverage shall preclude subrogation claims against the Region and any other person insured under the policy and be primary insurance in response to claims. Any insurance or self-insurance maintained by the Region and any other person insured under the policy shall be considered excess of the Vender's insurance and shall not contribute with it. The minimum amount of insurance required herein shall not modify, waive or otherwise alter the Recipient's obligation to fully indemnify the Region under this Agreement. Any failure to comply with any provision of the insurance policy by the Authorized User shall not affect coverage provided to the Region.

The Region reserves the right to modify the insurance requirements as deemed suitable. If The Region requests to have the amount of insurance increased or to obtain other special insurance for the sharing of the Information described in this Agreement then the Authorized User shall endeavour forthwith to obtain such increased or special insurance at the Region's expense.

ARTICLE 8. TERMINATION.

- 8.1. **Termination for Breach.** The Region may terminate this Agreement immediately upon notice to the Authorized User in the event of any breach by the Authorized User if any material representation, warranty, condition or covenant of this Agreement or if the EPI Data Agreement or the KPS Data Agreement are terminated for any reason whatsoever.

- 8.2. **Provision of Information Terminates.** Upon termination of this Agreement the Region shall have no further obligation to provide Information to the Authorized User and the Authorized User shall immediately stop using the Information and shall securely destroy it in accordance with Article 6.
- 8.3. **No Further Use Without Consent.** In addition to the foregoing, if the Region terminates this Agreement for breach pursuant to this Article, the Authorized User shall not continue with the use and analysis of the Information after the date of termination without the prior written consent of Smart Waterloo Region.

ARTICLE 9. NOTICE.

- 9.1. **Notice.** Notices under this Agreement ("Notices") shall be in writing and shall be delivered personally or by pre-paid courier, or sent by email, registered mail, or postage pre-paid and addressed to the other party as provided below or as either party shall later designate to the other in writing.

To the Region:

Rod Regier, Commissioner of Planning, Development and Legislative Services

8th Floor, 150 Frederick Street, Kitchener, Ontario, N2G 4J3

██████████@regionofwaterloo.ca

519-575-4400 ext. ██████████

To the Authorized User:

- 9.2. **Effective Notice.** All Notices shall be effective:
- (a) at the time the delivery is made if the Notice is delivered personally, by pre-paid courier or by email; or
 - (b) three (3) days after the day the Notice was deposited in the mail if the Notice is sent by registered or postage prepaid mail, unless the day the Notice is effective falls on a day when the Region is normally closed for business, in which case the Notice shall not be effective until the next day that is a day when the Region is normally open for business.

ARTICLE 10. GENERAL.

- 10.1 **Notification on Breach.** The Authorized User shall notify Smart Waterloo Region immediately upon becoming aware that any of the terms of this Agreement may have been or have been breached. If the breach might result in a privacy breach, the Authorized Users shall:
- a) take immediate steps to contain or limit the privacy breach
 - b) promptly investigate the cause of the privacy breach;
 - c) comply with any reasonable requirements or directions that in the opinion of Smart Waterloo Region would improve the adequacy and effectiveness of the Authorized Users measures to safeguard or ensure privacy or to ensure the protection of the Information in accordance with Section 4.6.
- 10.2 **Assignment and Transfer.** Neither party shall assign or transfer this Agreement, any part of this Agreement, or any benefit of interest in or under this Agreement, without the prior written consent of the other party.
- 10.3 **Audit.** In order to ensure that the Authorized User is complying or has complied with the provisions of this Agreement regarding the protection of the Information, including the use and disclosure of the Information, the Region or its authorized auditor or contractor may, upon 5 days' written notice, conduct an audit or inspection of the Authorized User's operations in respect of the Information. The Organization shall cooperate with the Region or its authorized auditor or contractor.
- 10.4 **The Organization Not a Partner, Agent or Employee.** The Authorized User shall have no power or authority to bind the Region or to assume or create any obligation or responsibility, express or implied, on behalf of the Region. The Authorized User shall not hold itself out as an agent, partner or employee of the Region. Nothing in this Agreement shall have the effect of creating an employment, partnership or agency relationship between the Region, and the Authorized User (or any of the Authorized User directors, officers, employees, agents, partners, affiliates, volunteers or subcontractors).
- 10.5 **Further Assurances.** The parties agree to do or cause to be done all acts and things necessary to implement and carry into effect this Agreement to its full extent.
- 10.6 **Survival.** Section 3.3 (No Promise), Article 4 (Use and Disclosure of Information), Article 5 (Intellectual Property Rights and Use of Reports), Article 6 (Destruction of Information), Article 7 (Liability, Indemnification and Insurance), Section 10.1, Section 10.3, this Section 10.6, and any other section that by its

nature extends beyond the expiration or termination shall survive and remain in effect until all obligations are satisfied..

- 10.7 **Compliance with Laws.** Both parties shall comply with all applicable federal, provincial and municipal laws, rules, orders, regulations, and by-laws in respect of the performance of this Agreement.
- 10.8 This Agreement shall be construed and enforced in accordance with, and the rights of the parties shall be governed by, the laws of the Province of Ontario and the laws of Canada applicable therein.
- 10.9 No party shall use, or authorize others to use, the names, symbols or marks of another party hereto or its staff for any endorsement purposes without prior written approval from the party whose name, symbols or marks are to be used.
- 10.10 This Agreement shall not be amended, modified, varied or supplemented except in writing signed by each of the parties.
- 10.11 **Counterparts.** This Agreement may be executed in counterparts, each of which shall constitute an original and all of which taken together shall constitute one and the same instrument. Delivery of an executed counterpart of this Agreement by facsimile or electronic transmission shall be as effective as delivery of an originally executed counterpart hereof.

In witness whereof the parties agree to this Agreement

THE REGIONAL MUNICIPALITY OF WATERLOO

PER: _____

Name: Rod Regier

Title: Commissioner of Planning, Development and Legislative Services

I have the authority to bind the corporation [By-Law 18-036, Schedule "A", s. 85]

[AUTHORIZED USER]

PER: _____

Name:

Document Number: 2913486

Version: 7

Title:

I have the authority to bind the corporation

Document Number: 2913486

Version: 7

Memorandum of Understanding
Concerning the Release of Information Collected Using the
Early Development Instrument (Cycle 4)
From
Ontario Ministry of Education
to
Regional Municipality of Waterloo
For Purposes Under the Child Care and Early Years Act, 2014

THIS AGREEMENT dated this 24th day of May, 2016

BETWEEN:

HER MAJESTY THE QUEEN IN RIGHT OF ONTARIO
as represented by the
Minister of Education

(referred to as the "Ministry")

– and –

Regional Municipality of Waterloo

(referred to as the "Organization")

Each a "Party", and collectively referred to as the "Parties"

WHEREAS the Ministry collects information related to the Early Development Instrument (EDI) in Ontario as part of its mandate and under Section 8.1 of the *Education Act*, which provides the ministry with statutory authority to indirectly collect personal information from school boards to plan, deliver, evaluate and monitor programs or services that it provides or funds;

AND WHEREAS the Ministry owns the provincial EDI information collected in the 2014-15 school year;

AND WHEREAS the Organization requires EDI information under the custody and control of the Ministry for the purposes of carrying out its duties under the *Child Care and Early Years Act, 2014*;

AND WHEREAS the Organization does not require access to the Information in personally identifiable form;

AND WHEREAS the Information includes Derivable Personal Information and is susceptible to indirect re-identification, by means of variables (quasi-identifiers) when used in combination;

AND WHEREAS the probability for re-identification increases when data provided by the Ministry is combined with other related data;

THEREFORE in consideration of the mutual covenants contained in this Agreement, and subject to the terms and conditions set out in this Agreement, the Ministry and the Organization covenant and agree as follows:

ARTICLE 1 DEFINITIONS AND INTERPRETATION

- 1.1 **Definitions.** In this Agreement including the recitals above, the following words shall have the following meanings:

"Authorized Users" means individuals who are designated by the Organization to conduct analysis using the Information solely for the purposes outlined in Article 4.

"Derivable Personal Information" means information that could potentially identify an individual, due to a subset of fewer than ten (10) observations, through a process of elimination, or otherwise.

"Early Development Instrument (EDI)" means a teacher-completed questionnaire that assesses children's developmental health at school entry in five domains: physical health and well-being; social competence; emotional maturity; language and cognitive development, and communication skills and general knowledge. The EDI was developed by Dr. Magdalena Janus and Dr. Dan Offord.

"Encrypt" means to render unidentifiable any information that identifies an individual or information for which it is reasonably foreseeable in the circumstances that could be utilized, either alone or with other information, to identify an individual, and **"Encrypted"** has a corresponding meaning.

"FIPPA" means the *Freedom of Information and Protection of Privacy Act*, R.S.O. 1990, c. F.31, as amended.

"Indemnified Parties" means her Majesty the Queen in right of Ontario, her Ministers, directors, officers, agents, appointees, and employees.

"Information" means all information including all database elements and databases, if any, as described in Appendix 1, including de-identified information about individuals.

"Intellectual Property" means any intellectual, industrial, or other proprietary right of any type in any form protected or protectable under the laws of Canada, any foreign country, or any political subdivision of any country, including, without limitation, any intellectual, industrial or proprietary rights protected or protectable by legislation, by common law or at equity.

"Personal Information" means recorded information about an identifiable individual or that may identify an individual.

"Record", for the purposes of the Agreement, means any recorded information, including any Personal Information, in any form: (a) provided by the Ministry to the Organization, or provided by the Organization to the Ministry, for the purposes of the Agreement; or (b) created by the Organization in the performance of the Agreement.

"Report" means the final version of any written material, in any format and on any media, including print, electronic and digital, produced by or on behalf of the Organization that reports outcomes, results or conclusions based on or contains the Information.

ARTICLE 2 TERM

- 2.1 **Term.** This Agreement is effective from the date it is signed by both Parties until terminated pursuant to Article 7.

ARTICLE 3 INFORMATION TO BE PROVIDED

- 3.1 **Information Provided by the Ministry.** The Ministry shall provide the Information to the Organization at the times, in the format, and by such means of disclosure as is set out in Appendix 1.
- 3.2 **Encrypted Information.** Despite any other provision of this Agreement where, in the opinion of the Ministry, the provision of any portion of the Information would result in a disclosure of Personal Information, the Ministry may encrypt such portion of the Information.
- 3.3 **No Promise.** There is no representation, warranty, condition, or other promise of any kind, express, implied, statutory, or otherwise, as to the accuracy, completeness, reliability, currency, or veracity of the Information. The Ministry assumes no obligation or liability for the provision of updates to the Information during the term of this Agreement.

ARTICLE 4 USE AND DISCLOSURE OF INFORMATION

- 4.1 **Use and Disclosure.** The Organization shall use the Information solely for the purposes of carrying out its duties under the *Child Care and Early Years Act, 2014* (Section 56) and specifically to:
- (a) develop and administer local policies respecting the operation of child care and early years programs and services;
 - (b) administer the delivery of financial assistance provided by the Minister under clause 54 (1) (b), in accordance with the regulations;
 - (c) coordinate the planning and operation of child care and early years programs and services with the planning and provision of other human services delivered by the service system manager;
 - (d) assess the economic viability of the child care and early years programs and services in the service area and, if necessary, make or facilitate changes to help make such programs and services economically viable;
 - (e) perform such other duties as may be prescribed by the regulations.
- 4.2 The Organization shall report all results using the Information at an aggregated level only. In cases where there are fewer than ten (10) records, data must be aggregated further to ensure that no child can be identified.
- 4.3 The Organization shall not:
- (a) use or disclose the Information for any purpose other than the purposes defined in Article 4.1;
 - (b) permit any person except an Authorized User to have access to or to use or disclose the Information;
 - (c) use or disclose the Information for the purpose of identifying one or more individuals;
 - (d) use or disclose the Information for the purpose of individual-level student diagnosis;
 - (e) identify schools or school boards in any reports using the Information;
 - (f) manipulate, process, or otherwise deal with the Information in any manner or by any means, electronic or otherwise, that creates, renders, extracts, or otherwise yields any Personal Information; or
 - (g) match, merge, or link the Information with other data or information to create Personal Information or Derivable Personal Information that results in identification of one or more individuals; and
 - (h) report the Information when the report features fewer than ten (10) records.

- 4.4 **Confidentiality.** The Organization shall ensure that any Authorized User who is given access to the Information by it does not:
- (a) use or disclose the Information for any purpose other than the purposes defined in Article 4.1;
 - (b) permit any person except an Authorized User to have access to or to use or disclose the Information;
 - (c) use the Information for the purpose of identifying one or more individuals;
 - (d) manipulate, process, or otherwise deal with the Information in any manner or by any means, electronic or otherwise, that creates, renders, extracts, or otherwise yields any Derivable Personal Information or any Personal Information; or
 - (e) match, merge, or link the Information with other data or information to create Personal Information or Derivable Personal Information that results in identification of one or more individuals.
- 4.5 **Authorized Users.** The Organization shall limit access to the Information to Authorized Users. The Organization shall immediately deny access to any Authorized User who no longer needs the Information for the purposes outlined in Article 4.
- 4.6 **Protection of Information.** The Organization shall protect the Information by putting in place reasonable security arrangements, including all necessary administrative, technical and physical safeguards, to ensure the confidentiality and security of the Information against such risks as unauthorized access, use or disclosure.
- 4.7 **Disclosure.** For the purposes of this section, "disclose" and "disclosure" of the Information includes any redistribution of the Information, whether for a fee or not.

ARTICLE 5 INTELLECTUAL PROPERTY RIGHTS AND USE OF REPORTS

- 5.1 **Information.** The Organization has no intellectual property right, title or interest in the Information. No ownership rights in or to the Information are transferred to the Organization by this Agreement. The Ministry reserves all of its intellectual property rights including copyright, and all other rights in and to the Information, that are not expressly granted by this Agreement.
- 5.2 **Reports.** The Ministry shall not own any copyright or other intellectual property rights in any reports or analysis of the Information prepared by the Organization.
- 5.3 **No Publication.** For certainty, the Organization shall ensure that any report using the Information and related data analysis provided to any third party or published by the Organization does not contain any Identifying Information,

Personal Information, or Derivable Personal Information, derived from or based on the Information.

- 5.4 **Ministry Use of Reports.** The Organization hereby grants to the Ministry a non-exclusive, perpetual, irrevocable, world-wide, fully paid-up, royalty-free licence to use, copy, adapt, translate and publish for non-commercial purposes, including to publish on its own intranet and on any Ontario Internet, any and all Reports of the prepared by the Organization that have been provided to the Ministry.
- 5.5 **The Organization Warranties.** The Organization warrants and covenants that it has, or at all material times will have, all intellectual property rights and all other rights necessary to grant every licence and right granted by the Organization under this Agreement, without violating or infringing the intellectual property rights or any other rights of any third-party.
- 5.6 **FIPPA Records and Compliance.** The Organization and the Ministry acknowledge and agree that FIPPA applies to and governs all Records and may require the disclosure of such Records to third parties. Furthermore, the Organization agrees:
- (a) to keep Records secure;
 - (b) to provide Records to the Ministry within seven (7) calendar days of being directed to do so by the Ministry for any reason including an access request or privacy issue;
 - (c) not to access any Personal Information unless the Ministry determines, in its sole discretion, that access is permitted under FIPPA;
 - (d) not to directly or indirectly use, collect, disclose or destroy any Personal Information for any purposes that are not authorized by the Ministry;
 - (e) to ensure the security and integrity of Personal Information and keep it in a physically secure and separate location safe from loss, alteration, destruction or intermingling with other records and databases and to implement, use and maintain the most appropriate products, tools, measures and procedures to do so;
 - (f) to implement other specific security measures that in the reasonable opinion of the Ministry would improve the adequacy and effectiveness of the Organization's measures to ensure the security and integrity of Personal Information and Records generally; and
 - (g) that any confidential information supplied to the Ministry may be disclosed by the Ministry where it is obligated to do so under FIPPA, by an order of a court or tribunal or pursuant to a legal proceeding;

and the provisions of this paragraph shall prevail over any inconsistent provisions in the Agreement.

- 5.7 **Acknowledgement.** Unless otherwise notified by the Ministry, the Organization shall acknowledge that it has used data provided by the Ministry for the purposes

in Article 4 in every report or analysis prepared using the Information and shall indicate that the views expressed in the reports and analyses are the views of the Organization and do not necessarily reflect those of the Ministry.

ARTICLE 6

LIABILITY, INDEMNIFICATION AND INSURANCE

- 6.1 **Ministry Not Liable.** The Ministry shall not be liable to the Organization, its personnel, or any other person, for any losses, expenses, costs, damages or liabilities, or any causes of action, actions, claims, demands, lawsuits or other proceedings in any way based upon, occasioned by, attributable to, arising out of or by reason of, the use of the Information by the Organization, this Agreement, the Organization's performance of its obligations under this Agreement, or any failure of the Organization to perform those obligations unless caused by the sole negligence of the Ministry.
- 6.2 **Indemnification.** The Organization hereby agrees to indemnify and hold harmless the Indemnified Parties from and against any and all liability, loss, costs, damages and expenses (including legal, expert and consultant fees), causes of action, actions, claims, demands, lawsuits or other proceedings, (collectively "Claims"), by whomever made, sustained, brought or prosecuted, including for third party bodily injury (including death), personal injury and property damage, in any way based upon, occasioned by or attributable to anything done or omitted to be done by the Organization, its subcontractors or their respective directors, officers, agents, employees or independent contractors in the course of or otherwise in connection with this Agreement unless caused by the sole negligence of the Ministry. The Organization further agrees to indemnify and hold harmless the Indemnified Parties for any incidental, indirect, special or consequential damages, or any loss of use, revenue or profit, by any person, entity or organization including, without limitation, the Indemnified Parties, claimed or resulting from any Claims unless caused by the sole negligence of the Ministry.
- 6.3 **The Organization's Insurance.** The Organization represents and warrants that it has, and shall maintain for the term of the Agreement, at its own cost and expense, with insurers having a secure A.M. Best rating of B+ or greater, or the equivalent, all the necessary and appropriate insurance that a prudent person carrying out a project using the Information would maintain, including commercial general liability insurance on an occurrence basis for third party bodily injury, personal injury and property damage, to an inclusive limit of not less than two million dollars (\$2,000,000) per occurrence. The policy shall include the following:
- (a) Indemnified Parties as additional insureds with respect to liability arising in the course of performance of the Organization's obligations under, or otherwise in connection with, the Agreement;

- (b) a cross-liability clause;
- (c) contractual liability coverage; and
- (d) a 30-day written notice of cancellation, termination or material change.

6.4 **Proof of Insurance.** The Organization shall provide the Ministry with certificates of insurance, or other proof as may be requested by the Ministry, which confirms the insurance coverage as provided for in section 6.3. Upon the request of the Ministry, the Organization shall make available to the Ministry a copy of each insurance policy.

ARTICLE 7 TERMINATION

- 7.1 **Termination for Breach.** The Ministry may terminate this Agreement immediately upon notice to the Organization in the event of any breach by the Organization of any material representation, warranty, condition or covenant of this Agreement.
- 7.2 **Termination for Convenience.** Either party may terminate this Agreement at any time, without cause, upon at least sixty (60) days prior notice to the other party.
- 7.3 **Provision of Information Terminates.** Upon termination of this Agreement the Ministry shall have no further obligation to provide Information to the Organization and the Organization shall immediately stop using the Information and shall securely destroy it in accordance with Article 8.
- 7.4 **No Further Use Without Consent.** In addition to the foregoing, if the Ministry terminates this Agreement for breach pursuant to this Article, the Organization shall not publish or permit the publication of any reports using the Information or continue with the use and analysis of the Information after the date of termination without the prior written consent of the Ministry.

ARTICLE 8 DESTRUCTION OF INFORMATION

- 8.1 **Destruction.** The Organization shall securely destroy the Information promptly upon termination of this Agreement.
- 8.2 **Notification.** The Organization shall notify the Ministry in writing of the secure destruction of the Information within 7 calendar days of the termination of this Agreement.

ARTICLE 9 NOTICE

- 9.1 **Notice.** Notices under this Agreement ("Notices") shall be in writing and shall be delivered personally or by pre-paid courier, or sent by facsimile, registered mail, or postage pre-paid and addressed to the other party as provided below or as either party shall later designate to the other in writing.

To the Ministry:

Katherine Kelly Gatten
Director, Business Planning, Outcomes and Assessments Branch
Early Years Division, Ministry of Education
900 Bay Street, 24th Floor Mowat Block, Toronto, ON M7A 1L2
Phone: 416-314-0903
Email: Katherine.Kellygatten@ontario.ca

To the Organization:

Nancy Dickieson
Regional Municipality of Waterloo
99 Regina Street South, 5th Floor
PO Box 1633
Waterloo, ON N2J 4V3
Phone: 519-883-2177
Email: ndickieson@regionofwaterloo.ca

- 9.2 **Effective Notice.** All Notices shall be effective:
- (a) at the time the delivery is made if the Notice is delivered personally, by pre-paid courier or by facsimile; or
 - (b) three (3) days after the day the Notice was deposited in the mail if the Notice is sent by registered or postage prepaid mail, unless the day the Notice is effective falls on a day when the Ministry is normally closed for business, in which case the Notice shall not be effective until the next day that is a day when the Ministry is normally open for business.

ARTICLE 10 GENERAL

- 10.1 **Notification on Breach.** The Organization shall notify the Ministry in writing immediately upon becoming aware that any of the terms of this Agreement may have been or have been breached. If the breach might result in a privacy breach, the Organization shall:

- (a) take immediate steps to contain or limit the privacy breach;
 - (b) promptly investigate the cause of the privacy breach; and
 - (c) comply with any reasonable requirements or directions that in the opinion of the Ministry would improve the adequacy and effectiveness of the Organization's measures to safeguard or ensure personal privacy or to ensure the protection of the Information in accordance with section 4.4.
- 10.2 **Assignment and Transfer.** Neither party shall assign or transfer this Agreement, any part of this Agreement, or any benefit or interest in or under this Agreement, without the prior written consent of the other party.
- 10.3 **Audit.** In order to ensure that the Organization is complying or has complied with the provisions of this Agreement regarding the protection of the Information, including the use and disclosure of the Information, the Ministry or its authorized auditor or contractor may, upon 5 days' written notice, conduct an audit or inspection of the Organization's operations in respect of the Information. The Organization shall cooperate with the Ministry or its authorized auditor or contractor.
- 10.4 **The Organization Not a Partner, Agent or Employee.** The Organization shall have no power or authority to bind the Ministry or to assume or create any obligation or responsibility, express or implied, on behalf of the Ministry. The Organization shall not hold itself out as an agent, partner or employee of the Ministry. Nothing in this Agreement shall have the effect of creating an employment, partnership or agency relationship between the Ministry, and the Organization (or any of the Organization's directors, officers, employees, agents, partners, affiliates, volunteers or subcontractors) or constitute an appointment under the *Public Service Act*, R.S.O. 1990, c. P.47, as amended.
- 10.5 **Further Assurances.** The parties agree to do or cause to be done all acts and things necessary to implement and carry into effect this Agreement to its full extent.
- 10.6 **Survival.** Section 3.3 (No Promise), Article 4 (Use and Disclosure of Information), Article 6 (Liability, Indemnification and Insurance), Article 8 (Destruction of Information), Section 10.1, Section 10.3 and this Section 10.6 shall survive the termination of this Agreement for any reason.

IN WITNESS WHEREOF the parties have made this Agreement.

**Her Majesty the Queen
in right of Ontario as represented by
Minister of Education**

Signature: _____

Name: Katherine Kelly Gatten

Title: Director, Business Planning, Outcomes and Assessment
Branch

Date of Signature: May 26, 2016

Regional Municipality of Waterloo

Signature: _____

Name: Nancy Dickieson

Title: Director, Children's Services

Date of Signature: May 26, 2016

APPENDIX 1

Description of Information

Cycle 4 of the Early Development Instrument (EDI) was collected in 2015 from Ontario's 72 district school boards and 3 district school area boards. The data were collected using the Ontario 2014-15 EDI questionnaire. The Information that will be shared with the Organization is solely the EDI data that pertains to the Organization's municipal boundaries.

Timing, Format, and Means of Disclosure

Timing:

The Ministry shall provide the Organization the Information listed above in Appendix 1, on a date to be determined.

Format:

The Ministry shall provide the Organization the Information in Microsoft Excel or SPSS file formats.

Means of Disclosure:

The Ministry, or a designate, shall forward the Information to the Organization using a secure data transmission system such as the Government of Ontario Enterprise Attachment Transfer Service, access to which shall be limited to the Authorized Users.

DATA SHARING AGREEMENT ("Agreement")

BETWEEN: McMaster University ("McMaster")
1280 Main Street West
Hamilton, Ontario
L8S 4L8

AND

The Regional Municipality of Waterloo ("Organization")
150 Frederick Street,
Kitchener, Ontario
N2G 4J3

Date: April 1, 2018 ("**Effective Date**")

Preamble:

Whereas, McMaster's Offord Centre for Child Studies (OCCS) has implemented the Kindergarten Parent Survey (KPS) in Ontario during the 2017/2018 school year for the purpose of collecting data to better understand the environments, relationships, and services that impact children's developmental health under the leadership of Dr. Magdalena Janus, ("Principal Investigator");

Whereas, the Organization requires KPS data Regional Municipality of Waterloo for the period of 2017/2018 ("Data") for research purposes and otherwise carrying out its duties (the "Purpose");

Therefore, in consideration of the mutual covenants contained in this Agreement, and subject to the terms and conditions set out herein, McMaster and the Organization agree as follows:

1. Representatives

1.1 Each party will designate a senior level supervisor/administrator to represent its respective interests regarding matters of data sharing and release of information as follows:

For **OCCS**:

Ashley Gaskin
Research Coordinator
Offord Centre for Child Studies
201A – 175 Longwood Road S.
Hamilton, Ontario L8P 0A1
Tel: 905-525-9140, ext. 21469
Email: gaskin@mcmaster.ca

For Organization:

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Barb Cardow
Director, Children's Services
Regional Municipality of Waterloo
150 Frederick Street
Kitchener, Ontario N2G 4J3
Tel: 519-883-2177
Email: BCardow@regionofwaterloo.ca

2. Use of Data, Results and Reporting

2.1 The Organization hereby agrees that:

- (a) the Data will be used in compliance with all applicable laws and regulations;
- (b) it will not use or disclose the Data for any purposes other than the Purpose described herein;
- (c) there will be no interpretation of the Data for individual students and families;
- (d) it will not match, merge or link the Data with other data or information that results in identification of one or more individuals;
- (e) the interpretation of analysis using the Data will follow accepted scientific standards;
- (f) no Data shall be reported when the report features 10 records or less; in cases where there are less than 10 records, Data must be aggregated further to ensure that no child or family can be identified and that appropriate scientific standards are met;
- (g) in all analyses that are completed using individual level Data, only group level data will be reported; schools and school boards will not be identified in any public reporting of the KPS findings in the public domain;
- (h) the Data shall not be distributed to any third parties.

3. Confidentiality and Data Security

3.1 The Data files will be kept in a secure and confidential location within the Organization. Only designated qualified personnel within the Organization will have access to the Data. The Data must be stored on a password-protected computer drive.

3.2 The Organization shall not use the Data to identify any individuals from whom such Data were collected. If individual level data are linked with other data sources that provide ways of identifying students or families, this analysis will be done in a secure and confidential manner that ensures that the identities of individual respondents and children are protected.

3.3 The Organization shall use appropriate safeguards to prevent any unauthorized use or disclosures of the Data and shall report to McMaster any unauthorized use or disclosure to which the Organization becomes aware or of any breach of this Agreement.

3.4 McMaster will only share data with the Organization in accordance with appropriate consent or other legal authorization.

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3.5 Both parties agree that the Organization is bound by the *Municipal Freedom of Information and Protection of Privacy Act* in the performance of this Agreement.

4. Intellectual Property Rights and Use of Reports

4.1 The Organization has no intellectual property right, title or interest in the Data. No ownership rights in or to the Data are transferred to the Organization by this Agreement. McMaster retains all of its intellectual property rights in and to the Data that are not expressly granted by this Agreement.

4.2 McMaster shall not own any copyright or other intellectual property right in any reports or analysis of the Data prepared by the Organization.

4.3 The Organization shall ensure that any report using the Data and related analysis provided to any third party or published by the Organization does not contain any identifying information or personal information, derived from or based on the Data. The Organization shall acknowledge the contribution of the McMaster's OCCS and the Principal Investigator in any such report or publication.

5. Term and Termination

5.1 This Agreement shall enter into force as of the Effective Date and will terminate on the earliest of the following dates:

(a) on completion of the Purpose;

(b) on thirty (30) days written notice by either party to the other party; or

(c) immediately by McMaster if the Organization has not cured a breach of this Agreement within a reasonable time of being notified, in writing, of such breach.

5.2 Upon termination of this Agreement, McMaster shall have no further obligation to provide the Data to the Organization and the Organization will immediately discontinue its use of the Data and will, upon direction from McMaster, return or destroy the Data.

6. General Terms and Conditions

6.1 McMaster shall not be liable to the Organization, its personnel, or any other person, for any losses, expenses, costs, damages or liabilities, or any causes of action, actions, claims, demands, lawsuits or other proceedings in any way based upon, occasioned by, attributable to, arising out of or by reason of, the use of the Data by the Organization, this Agreement, the Organization's performance of its obligations under this Agreement, or any failure of the Organization to perform those obligations hereunder. The Organization will indemnify and hold McMaster harmless for any and all claims, damages and liabilities that may arise from the Organization's use of the Data.

6.2 No party shall be entitled to assign or transfer this Agreement or the rights and obligations hereunder to any third party without the prior written approval of other party.

6.3 This Agreement shall not be amended, modified, varied or supplemented except in writing signed by each of the parties.

6.4 No failure or delay on the part of any party hereto to exercise any right or remedy under this Agreement shall be construed or operate as a waiver thereof.

6.5 The parties hereto are independent contractors. Nothing contained herein shall be deemed or construed to create between the parties hereto a partnership or joint venture or employment

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or principal-agent relationship. No party shall have the authority to act on behalf of any other party or to bind another party in any manner.

6.6 Each party to this Agreement assumes responsibility for its own obligations under this Agreement.

6.7 No party shall use, or authorize others to use, the names, symbols or marks of another party hereto or its staff for any endorsement purposes without prior written approval from the party whose name, symbols or marks are to be used.

6.8 This Agreement shall be governed by and construed in accordance with the laws of the Province of Ontario and the federal laws of Canada applicable therein.

6.9 This Agreement may be executed by the Parties in counterparts and may be executed and delivered by facsimile or electronically by PDF and all such counterparts, facsimiles and PDF copies shall together constitute one agreement. The parties agree that facsimile or PDF copies of signatures have the same effect as original signatures.

MCMMASTER UNIVERSITY

THE REGIONAL MUNICIPALITY OF WATERLOO

PER: _____
Gay Yuyitung
Executive Director
McMaster Industry Liaison Office

PER: _____
Barbara Cardow
Director, Children's Services
Regional Municipality of Waterloo

Date

May 2, 2018
Date

**I have the authority to bind the
Corporation**

**I have the authority to bind the
Corporation pursuant to By-Law 12-017,
Schedule A, s. 77**

Signed by Principal Investigator:

Dr. Magdalena Janus
Offord Centre for Child Studies

SCHEDULE "C" DESCRIPTIONS OF DATA SETS FOR SWR DATA COLLABORATIVE MOU

EARLY DEVELOPMENT INSTRUMENT

Overall Description¹

The EDI is a 103-item questionnaire completed by kindergarten teachers in the second half of the school year that measures children's ability to meet age-appropriate developmental expectations in five general domains: Physical Health and Wellbeing, Social Competence, Emotional Maturity, Language and Cognitive Development, Communication Skills and General Knowledge.

The EDI is a tool that is used to reliably assess the developmental health (skills and behaviour) of children at the age of developmental transition from early development to school age in a holistic manner. The EDI is a holistic assessment because it encompasses five major areas of child development. The EDI is a reliable and valid measurement tool of developmental status completed on individual children between 3.5 and 6.5 years of age. After teachers complete the EDI on each individual child in their class, the results are grouped together to give a snap shot of how children are doing across schools, neighbourhoods, cities, or even provinces and countries.

Researchers often analyze EDI data by looking at the proportion of children in a population that are vulnerable to difficulties learning. The term "vulnerable" describes children who score low (below the 10th percentile cut-off of the comparison population) on any of the five domains. This provides a glimpse into the groups of children who are vulnerable for problems in later childhood by casting a wide net that includes all children who may benefit from universal programs. It captures the children who are struggling, but not only those who are doing so visibly to have already been identified. This group represents children for whom cost-effective, universal preventive programs are likely to make a difference.

Data Included

2010 and 2015 EDI data are included. Select variables were aggregated by Authorized Users of the original data sets by identifying the Census Canada Aggregated Dissemination Area (ADA) for each record of the data sets. This was done using postal code data. Once the ADA was identified for each record, the data sets were aggregated by the Authorized Users, with the aggregated data copied into a new file, including only data relevant to the project. ADAs with less than 10 records were suppressed. No identifiable information was included in the aggregated data set so that no personal information can be derived from the data sets.

¹ Information copied from the Offord Centre: <https://edi.offordcentre.com/>

Variable included for each ADA:

- Per cent English or French as Second Language
- Per cent with first language other than English or French
- Per cent of children that have a problem that affects their participation in class activities
- Average score in Physical Well-being domain (range = 0 to 10)
- Average score in Social Competence domain (range = 0 to 10)
- Average score in Emotional Maturity domain (range = 0 to 10)
- Average score in Language and Cognitive Development domain (range = 0 to 10)
- Average score in Communication and General Knowledge domain (range = 0 to 10)
- Per cent of children scoring low (vulnerable) in the Physical Well-being domain
- Per cent of children scoring low (vulnerable) in the Social Competence domain
- Per cent of children scoring low (vulnerable) in the Emotional Maturity domain
- Per cent of children scoring low (vulnerable) in the Language and Cognitive Development domain
- Percent of children scoring low (vulnerable) in the Communication and General Knowledge domain
- Per cent of children scoring low (vulnerable) on one or more domain
- Per cent of children that are male

Notes and Limitations

Full-Day Kindergarten: In 2014, Ontario had fully rolled out its full-day kindergarten (FDK) program, allowing all children in Waterloo Region access to FDK. 2015 is the first round of the Early Development Instrument and Kindergarten Parent Survey that captures data on students enrolled in FDK.²

Limitations³

- Teacher ability to complete the questionnaire based on his/her knowledge of student's development and well-being of a student after six months of interaction may not accurately reflect the level of the child's development.
- The EDI is not a clinical diagnostic tool and is not intended to diagnose issues within an individual.

² Information copied from "A Community Fit for Children"
http://www.earlyyearsinfo.ca/uploads/2/1/4/6/21464250/community_fit_2016.pdf

³ Information copied from Peel Region:
https://www.peelregion.ca/health/statusdata/DataSources/HSD12_21.asp

KINDERGARTEN PARENT SURVEY (KPS)

Overall Description⁴

The Kindergarten Parent Survey (KPS) is a voluntary questionnaire filled out by parents of Senior Kindergarten students. It gathers information about child's health and development; child care and prekindergarten experiences; participation in activities; neighbourhoods; and family demographics. It is sent home to families during the same year that the EDI is completed by SK teachers. In 2015, surveys went home to families of all Senior Kindergarten children who participated in the EDI, along with a free children's book and an envelope to return the survey in. French surveys were given to parents of children attending French language schools. Participation was voluntary, with a response rate of 54% (3151 surveys).

The KPS is a useful companion tool to the EDI as it provides information to assist communities in interpreting the EDI results. The results can help service providers assess the popularity of preschool programs; child care providers to get information on service usage, barriers, and satisfaction; and schools to measure parent involvement in school activities. Community planners can use information from the KPS to see how safe families feel in their neighbourhood, which resources they have (or do not) have access to, and their sense of social cohesion (e.g. sense of belonging in the community).

The core KPS consists of seven sections:

- Child Health and Development
- Child Care
- Pre-kindergarten
- Senior Kindergarten
- Family
- Neighbourhood
- Background Information

Data Included:

2015 KPS data are included. Select variables were aggregated by Authorized Users of the original data sets by identifying the Census Canada Aggregated Dissemination Area (ADA) for each record of the data sets. This was done using postal code data. Once the ADA was identified for each record, the data sets were aggregated by the Authorized Users, with the aggregated data copied into a new file, including only data relevant to the project. ADAs with less than 10 records were suppressed. No identifiable information was included in the aggregated data set so that no personal information can be derived from the data sets.

⁴ Description copied from Community Fit for Children:
http://www.earlyyearsinfo.ca/uploads/2/1/4/6/21464250/community_fit_2016.pdf

Variable included for each ADA:

- Per cent of families without regular family doctor or health care provider
- Per cent of children underweight using BMI
- Per cent of children overweight or obese using BMI
- Per cent of children that eat breakfast everyday
- Per cent of children that eat at least 4 servings of fruit and vegetables every day
- Per cent of children that always eat meals with their family
- Per cent of families that did not access services (Speech language, vision, OT, PT, Behaviour, MH, etc.)
- Per cent of families unable to find services they needed.
- Per cent of children that have more than 2 hours of screen time per day (including tv, computer, video games)
- Per cent of children that get less than 11 hours of sleep per night
- Average score on the social cohesion index
- Per cent of parents that speak language other than English or French at home most of the time
- Per cent of children that speak language other than English or French at home most of the time
- Per cent of families that have lived in Canada for less than 2 years
- Per cent of families that are lone-parent families
- Per cent of families that identify as First Nation, Metis or Inuit, or Aboriginal.
- Per cent of parents that did not complete high school
- Per cent of families with no disposable income
- Per cent of families on social assistance (Ontario Works or ODSP)

Notes and Limitations⁵

Full-Day Kindergarten: In 2014, Ontario had fully rolled out its full-day kindergarten (FDK) program, allowing all children in Waterloo Region access to FDK. 2015 is the first round of the Early Development Instrument and Kindergarten Parent Survey that captures data on students enrolled in FDK.

Parent-Reported Data: The Kindergarten Parent Survey relies on parent-reported data for many indicators, such as child height and weight and nutrition intake.

⁵ Information copied from "A Community Fit for Children"
http://www.earlyyearsinfo.ca/uploads/2/1/4/6/21464250/community_fit_2016.pdf

HEALTHY BABIES, HEALTHY CHILDREN

Healthy Babies, Healthy Children (HBHC) is a designed to help children in Ontario have a healthy start in life and provide them with opportunities to reach their potential. This voluntary program is delivered through Ontario's 36 public health units (PHUs) in partnership with hospitals and other community partners. The program consists of universal screening with targeted assessments and interventions for families and children from the prenatal period until their transition to school.

The Child and Family Health (CFH) Division of the Region of Waterloo Public Health and Emergency Services (ROWPHE) collect and own HBHC Screen data. This data is used to inform which families are offered HBHC programming. The HBHC Screen was reviewed and indicators of interest were identified if they related, or are a proxy measure, to factors that influence early child development. Analyzing these indicators alongside other local data sets will allow for a more comprehensive examination of early child development in Waterloo Region.

Data included:

- Proportion of screens with 2 or more 'yes' (this is a "with risk" screen)-broken down by all stages (prenatal, postpartum and early childhood)
- Proportion of screens with 2 or more 'yes' and then go on to have a confirmed risk IDA (broken down by all stages)
- Proportion of screens with 2 or more 'yes' that then go onto home visiting services (broken down by all stages)
- Client has concerns about money to pay for housing/rent, and family's food, clothing, utilities and other basic necessities?
- Mother did not complete high school?
- Multiple birth
- Premature
- Health conditions/medical complications during pregnancy that impact infant?
- Complications during labour and delivery?
- Maternal smoking of cigarettes during pregnancy?
- Maternal alcohol use during pregnancy?
- Maternal drug use during pregnancy?
- Maternal separation from infant greater than 5 days?
- Was the birth weight less than 1500g?
- Was the birth weight more than 4000g?

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- Birth Weight
- Congenital or acquired health challenge?
- Parent(s) identified a risk factor?
- Mother experienced a previous loss?
- Client or parenting partner has a history of depression, anxiety, or other mental illness?
- Feeding
- Birth Type
- Gestation
- Gravida
- Parity
- HBHC Screening Stage
- No prenatal care before sixth month?
- Mother is less than 18 years old?
- Mother was less than 18 years old when first child was born?
- Mother is a single parent?
- Mother and/or child do not have a designated primary care provider?
- Client expresses concern about their ability to parent baby/child?
- Client expresses concern about their ability to care for baby/child?
- Client cannot identify support person to assist with parenting of the baby/child?
- Client cannot identify support person to assist with care of the baby/child?
- Client or family in need of newcomer support?
- Client or partner has a disability that may impact parenting?
- Client's relationship with parenting partner is strained?
- Client or parenting partner has been involved with Child Protection Services as a parent?
- Client's response patterns are inconsistent or inappropriate to the baby's/child's cues?
- Health care professional has concerns about the wellbeing of client and/or baby/child?

SCHEDULE "D"

Aggregated Dissemination Area as defined by Statistics Canadaⁱ

The following are delineation criteria used to delineate the 2016 aggregate dissemination areas (ADA):

- The ADAs cover the entire country and, where possible, have a population count between 5,000 and 15,000 people. In order to permit stakeholder consultation and meet the operational constraint of releasing population and dwelling counts for ADAs in the winter following the census year, the population counts used to delineate ADAs are taken from the previous census (2011).
- ADAs respect provincial, territorial, census division (CD), census metropolitan area (CMA) and census agglomeration (CA) with census tract (CT) boundaries in effect for the 2016 Census.
- ADAs are based on one of three (3) existing 2016 census dissemination geographic areas: census tracts (CTs), Census subdivisions (CSDs) or dissemination areas (DAs):
 - Within CMAs and CAs with CTs, adjacent CTs are grouped to meet the ADA population criteria.
 - In areas without CTs (areas outside the CMAs and the largest CAs), where CSDs have a population less than 15,000, adjacent CSDs are grouped to meet the ADA population criteria.
 - In areas without CTs, where CSDs have a population greater than 15,000, adjacent DAs are grouped within these CSDs to meet the ADA population criteria.
- Each Indian reserve 2016 CSD and a small number of other areas where door-to-door canvassing occurred form their own separate ADA.


SCHEDULE "E" SMART WATERLOO REGION CHALLENGE STATEMENT

We will become the benchmark community in Canada for child and youth well-being by using early intervention, youth engagement and a connected-community framework to create adaptive, data-driven programs and scalable learning technologies that improve early child development, mental health and high school graduation rates.

ⁱ Statistics Canada. 2016. The aggregate dissemination area (ADA): a new census dissemination geographic area. Accessed online January 9, 2019: <https://www12.statcan.gc.ca/census-recensement/2016/geo/ADA/adainfo-eng.cfm>

6. Privacy Policies and Procedures

Appendix C

 Corporate Resources Policy		Section #	Policy #
		7	14.1
		Approval Date: May 29, 2018	Revision Date: xxxx
Title:	Information Access and Privacy Policy		
Responsibility:	Council & Administrative Services	Approval Level:	Council
Applies to:	All Staff		

POLICY STATEMENT:

The Region of Waterloo is committed to being open, accessible and transparent while maintaining the privacy of personal information, personal health information, and confidential information in its custody and control.

Providing access to records and protecting privacy are legislated obligations under the Municipal Freedom of Information and Protection of Privacy Act (MFIPPA) and Personal Health Information Protection Act (PHIPA).

Regional records are public documents, subject to limited legislative exemptions, and are available for review in accordance with established procedures.

PURPOSE:

The purpose of this policy is to ensure compliance with the requirements of MFIPPA and PHIPA by establishing policies and procedures that facilitate access to public records while protecting the privacy of personal information, personal health information and confidential information.

This policy is designed to ensure fair and impartial access to corporate records and information in the custody and control of the Region. It also sets out the roles, responsibilities, and operational requirements around how personal information and personal health information are collected, used, disclosed, and disposed of by the Region.

This policy applies to all Regional employees and corporate records, including records and information of members of Council that are created and used for the purpose of carrying out Regional business.

OPERATING PRINCIPLES:

Access to Information

The Region of Waterloo recognizes the right of individuals and groups to access information in its custody and control as an essential function of open government, accountability and transparency.

The Region will ensure that personal information and personal health information is as accurate, complete and up-to-date as is necessary for the purpose for which it is to be used. Individuals have a right to challenge the accuracy and completeness of their personal information or personal health information held by the Region and have it corrected as appropriate.

MFIPPA and PHIPA should only be used to supplement regular methods of requesting information. Access to information is provided by one of the four following methods:

1. Information request - Most requests received by the Region are for public records and are not submitted under MFIPPA or PHIPA. Staff are encouraged to respond to these information requests unless the records contain another person's personal information or personal health information; confidential information; or third party information which needs to go through the freedom of information request process.
2. Routine disclosure request - Staff will respond to requests from individuals or employees for their own personal information or personal health information where a routine disclosure procedure has been adopted by the program. If a routine disclosure procedure doesn't exist, the request will go through the freedom of information request process.
3. Information corrections request - Personal information or personal health information correction requests are processed by the program area staff that holds the record in accordance with the relevant correction procedure.
4. Freedom of information requests - Information Management & Archives is responsible for processing all formal MFIPPA requests. Public Health and Emergency Services Department and Sunnyside Home as health information custodians are responsible for processing all formal PHIPA requests. Delegated staff in those areas provide access, or give a copy of the requested records in accordance to the limited and specific exemptions and exclusions set out in MFIPPA or PHIPA.

See related request procedures for more information on responding to one of these request processes.

In order to facilitate access to records, the Region acknowledges the role that strong information management practices play in preventing records from being lost or inappropriately deleted, reducing search times and fees associated with mishandled information, and reducing the risk of privacy breaches. See the Information Management Accountability Operating Principle and Official Repository for Electronic Documents Operating Principle for more details on the responsibilities of employees to create and maintain accurate records of their activities.

Requesters' identities are protected and are only disclosed when there is a clear need in order to facilitate a request or as required by legislation. Access decisions in response to requesters exercising their right to access Regional information will be made in a consistent manner regardless of the requesters' identity.

Staff have a duty to ensure every reasonable effort is made to assist requestors, by providing complete, accurate and timely responses to their request using the appropriate access to information process. This includes working with the MFIPPA or PHIPA delegated staff and

responding to requests for records as part of the freedom of information process in a timely manner.

In accordance with MFIPPA and PHIPA, it is an offence to willfully alter, conceal, destroy/delete, or cause any person to do so, with the intention of denying access to a record or information contained in a record.

Protection of Privacy

Maintaining the privacy of personal information, personal health information, and confidential information is an important ethical, professional and legal requirement in the relationship between the Region and individuals/third parties whose information is handled in the course of providing services. The following privacy protection standards are in effect constantly:

1. Notice of Collection and Consent Requirements

- a. Staff may only collect personal information and personal health information with legal authority.
- b. The purpose for which personal information and personal health information is collected is identified to the individual at or before the time it is collected by way of a Notice of Collection.
- c. Staff make sure the knowledge and consent of the individual is obtained for the collection, use and disclosure of personal information or personal health information.
- d. Staff limit the collection of personal information and personal health information to only that which is necessary for the purposes identified and ensure information is collected by fair and lawful means.

2. Use of Information Limitations

- a. Personal information and personal health information collected by the Region will only be used for the purpose for which it was obtained or for a consistent purpose.
- b. The use of personal information or personal health information for any other purpose must have the consent of the individual to whom the information relates or be required by law enforcement.

3. Protection of Information

- a. All staff share responsibility for the protection and privacy of personal information, personal health information, and confidential information against theft or loss and unauthorized access, collection, use, disclosure, copying, modification, retention and disposal.
- b. The technical, administrative and physical safeguards in place will be appropriate to the information's sensitivity, the format in which it is held, and the related privacy risks.

- c. Physical security measures will be put in place to prevent unauthorized access to personal information, personal health information, and confidential information by staff and external parties.
- d. Personal information, personal health information, and confidential information will not be left exposed or visible when unattended. Staff will lock computer and mobile device screens with passwords and put physical records in locked locations when not in use.
- e. System, software and email passwords allowing access to personal information, personal health information, or confidential information are not shared or disclosed to others.
- f. Security and privacy provisions are included in contracts with outside providers of records and information storage or disposal services.

4. Retention of Information

- a. Personal information and personal health information will be retained only as long as is necessary according to the Corporate Information Retention and Disposal Schedule by-law.
- b. If not covered by the by-law, personal information and personal health information will be kept for a minimum of one year as prescribed by MFIPPA and PHIPA.

5. Privacy Complaints

- a. The Region will readily make available specific information about its policies and practices related to the management of personal information and personal health information.
- b. The Region will address complaints concerning its access and privacy practices.

6. Privacy Breach

- a. When discovered, staff will contain the effects of a breach of personal information or personal health information by determining the nature and scope of the incident, and issuing all required notifications through a clear communications and escalation plan according to the Privacy Breach Procedure.
- b. Where required by MFIPPA or PHIPA, privacy breaches will be reported to the Information & Privacy Commissioner of Ontario.

7. Privacy Impact Assessments

- a. Staff shall work with Information Management & Archives to conduct a privacy impact assessment on every new or changed service, technology or initiative that

involves the collection, use or disclosure of personal information or personal health information in accordance with the Privacy impact Assessment Procedure.

RESPONSIBILITIES:

Head under MFIPPA

The Regional Clerk is accountable to Council for compliance with MFIPPA and will take reasonable steps to ensure that all staff handles personal information in compliance with MFIPPA. As set out in By-Law 04-92, the Regional Clerk is the head for the Region under MFIPPA.

Head under PHIPA

The Medical Officer of Health is accountable to the Board of Health for compliance with PHIPA and will take reasonable steps to ensure that all Public Health and Emergency Services Department staff (ROWPHE) handles personal health information in compliance with PHIPA. The Medical Officer of Health is known as the head for ROWPHE under PHIPA.

The Chief, Paramedic Services is accountable to Council for compliance with PHIPA and will take reasonable steps to ensure that all Paramedic Services staff handles personal health information in compliance with PHIPA. The Chief, Paramedic Services is known as the head for Paramedic Services under PHIPA.

The Director, Seniors' Services is accountable to Council for compliance with PHIPA and will take reasonable steps to ensure that all Sunnyside Home staff handles personal health information in compliance with PHIPA. The Director, Senior's Services is known as the head for Sunnyside Home under PHIPA.

See the Access and Privacy Roles and Responsibilities Procedure for the delegation of authority to contact persons by the appropriate MFIPPA or PHIPA head.

Roles

Council approves this policy.

Chief Administrative Officer provides oversight and compliance with this policy by all Regional employees.

Regional Clerk acts as head under MFIPPA and is accountable for overseeing the administration of the legislation.

Manager, Information Management and Archives acts as the Freedom of Information Coordinator and is accountable for responding to formal FOI requests and access and privacy related issues, including privacy complaints.

Medical Officer of Health acts as head for ROWPHE under PHIPA and is accountable for overseeing the administration of the legislation.

Chief, Paramedic Services acts as head for Paramedic Services under PHIPA and is accountable for overseeing the administration of the legislation.

Director, Senior Services acts as head for Sunnyside Home under PHIPA and is accountable for overseeing the administration of the legislation. Supports routine disclosure practices to provide ease of access for clients.

Director, Information Technology Services ensures that the appropriate technological safeguards are implemented in accordance with MFIPPA and PHIPA.

Management takes reasonable steps to ensure that processes and practices for the handling of personal information or personal health information by their staff comply with MFIPPA or PHIPA. Supports routine disclosure practices to provide ease of access for clients.

Employees, Students, Consultants and Volunteers familiarize themselves with and follow any Region or program-specific procedures which direct or affect the handling of personal information or personal health information, as well as adhere to the Corporate Information Retention and Disposal Schedule by-law. Implements routine disclosure practices to provide ease of access for clients.

See the Access and Privacy Roles and Responsibilities Procedure for a more comprehensive description of each role.

DEFINITIONS:

Consistent purpose means personal information or personal health information collected by the Region is used for the purpose for which it was collected or similar consistent purposes when carrying out Regional business. The individual to whom the information relates might reasonably expect the use or disclosure of their information for the consistent purposes.

Control of a record means the power or authority to make a decision about the use or disclosure of a record.

Custody of a record means the keeping, care, watch, preservation or security of a record for a legitimate business purpose. While physical possession of a record may not always constitute custody, it is the best evidence of custody.

Identifying information means information that directly identifies an individual or for which it is reasonably foreseeable in the circumstances, that the information could be utilized, either alone or with other information, to indirectly identify an individual.

Information & Privacy Commissioner of Ontario hears appeals of decisions made by municipalities, issues binding orders, conducts privacy investigations, and has certain powers relating to the protection of personal privacy as set out in MFIPPA and PHIPA.

Personal information means recorded information about an identifiable individual including, information relating to the race, colour, religion, age, sex, sexual orientation or marital status of the individual; information relating to education, medical, financial or employment history of the individual; any identifying number or symbol assigned to the individual; address, telephone

number, fingerprints or blood type of the individual; personal opinions or views of the individual except if they relate to another individual; correspondence sent to an institution by the individual that is implicitly or explicitly of a private nature; views or opinions of another individual about the individual; and individual's name if it appears with other personal information relating to the individual.

Personal health information includes identifying information about an individual in oral or recorded form, if the information:

- relates to the physical or mental health of the individual, including information that consists of the health history of the individual's family;
- relates to the providing of health care to the individual, including the identification of a person as a provider of health care to the individual;
- relates to payments or eligibility for health care, or eligibility for coverage for health care, in respect of the individual;
- is the individual's health card number; or
- identifies an individual's substitute decision-maker.

Privacy impact assessment is the process for identifying, assessing and mitigating privacy risks. The Region develops and maintains privacy impact assessments for all new or modified programs that involve the collection, use, or disclosure of personal information or personal health information.

Public record is a record that has passed through an open public process, thereby making it a public record that can be provided to a requester without going through a routine disclosure or freedom of information request process.


Record means any information however recorded, whether in printed form, on film, by electronic means or otherwise, and includes the following: correspondence, memorandum, book, plan, map, drawing, diagram, pictorial or graphic work, photograph, film, microfilm, sound recordings, videotape, machine readable record, any other documentary material, regardless of physical form or characteristics, and any copy thereof.

Substitute decision-maker means a person who is authorized under MFIPPA or PHIPA to consent on behalf of the individual to the collection, use or disclosure of personal information or personal health information about the individual or exercise the right to request access to or correction of personal information or personal health information. A substitute decision-maker may include:

- a person legally authorized to make a decision about treatment on behalf of an individual who is not capable;
- a person acting with the written authorization of the affected individual in relation to the individual's personal information or personal health information;
- a guardian or parent with lawful custody of a child less than 16 years of age;
- the estate trustee or other responsible person in relation to the personal information or personal health information of a deceased individual; or
- other persons authorized under the law of Ontario or Canada to act on behalf of the individual (e.g. the public guardian and trustee or the office of the children's lawyer).

SEE ALSO:

- Human Resources Policy I-4 - Confidential Information ([DOCS #41657](#))
- Human Resources Policy I-6 - Use of Information Technology ([DOCS #41658](#))
- Promise of Confidentiality HR15 ([DOCS #240497](#))
- Information Management Accountability Operating Procedure ([DOCS #475462](#))
- Official Repository for Electronic Documents Operating Procedure ([DOCS #413485](#))
- Collection, Use and Disclosure Consent Requirements Procedure ([DOCS #1675097](#))
- Collection of Public Information and Posting to the Web Procedure ([DOCS #2567311](#))
- Dealing with Unsolicited Personal Information Procedure ([DOCS #2549365](#))
- Handling Information Outside of Region Premises Privacy Procedure ([DOCS #1704109](#))
- Privacy Breach Procedure ([DOCS #1704033](#))
- Freedom of Information Request Procedure ([DOCS #2540310](#))
- Disclosure of Information to Law Enforcement Procedure ([DOCS #1703529](#))
- Requests for Information Correction Procedure ([DOCS #1676317](#))
- Privacy Complaint Procedure ([DOCS #1707490](#))
- Personal Information Research Activities Procedure ([DOCS #1695714](#))
- Use of Video or Audio Recording Devices by Third Parties Privacy Procedure ([DOCS #1706710](#))
- Privacy Impact Assessment Procedure ([DOCS #1682210](#))
- Access and Privacy Roles and Responsibilities Procedure ([DOCS #2707915](#))
- Employee's Guide to the Municipal Freedom of Information and Protection of Privacy Act ([DOCS #2017230](#))
- Corporate Information Retention and Disposal Schedule 2014 ([DOCS #888044](#))
- [Municipal Freedom of Information and Protection of Privacy Act](#)
- [What is Personal Information Fact Sheet](#)
- [Ontario's Municipal Freedom of Information and Protection of Privacy Act A Mini Guide](#)
- [10 Fair Information Principles](#)
- ROWPHE Personal Health Information Privacy Policy Statement ([DOCS #324519](#))
- [Public Health Statement of Information Practices](#)
- [Paramedic Services Statement of Information Practices](#) ([DOCS #2245137](#))
- Senior's Services Personal Health Information Protection Procedure Manual ([DOCS #1446339](#))
- [Personal Health Information Protection Act](#)

 CORPORATE RESOURCES POLICY		Section #	Policy #
		7 Approval Date: xxxx	14.6 Revision Date: xxxx
Title:	Privacy Breach Procedure		
Responsibility:	Council & Administrative Services	Approval Level:	
Applies to:	All Staff		

POLICY STATEMENT:

The Region of Waterloo is committed to being open, accessible and transparent while maintaining the privacy of personal information, personal health information, and confidential information in its custody and control.

Providing access to records and protecting privacy are legislated obligations under the Municipal Freedom of Information and Protection of Privacy Act (MFIPPA) and Personal Health Information Protection Act (PHIPA).

Regional records are public documents, subject to limited legislative exemptions, and are available for review in accordance with established procedures.

PURPOSE:

This procedure outlines the steps to be taken if records of personal information or personal health information are breached by loss, theft or unauthorized access. For a one page overview of this policy refer to the Privacy Breach Protocol in Appendix A.

OPERATING DETAILS:

MFIPPA and PHIPA require municipalities to notify affected individuals if their personal information or personal health information records are lost, stolen or accessed by unauthorized persons.

Where personal information or personal health information is provided to an external agency that is functioning on behalf of the Region, operating agreements of understanding between the Region and the external agency must include a requirement that the Region be notified of a privacy breach.

Records are considered "lost" where there is a reasonable belief that the records cannot be located, and it is probable that the records are no longer in the custody or control of the Region, or are not physically within Regional premises.

Records are considered "stolen" where there is a reasonable belief that the records are in the custody of a third party who is not entitled to receive Regional records. Records which were not the object of a theft (e.g. records within a stolen briefcase, or stored on a laptop computer) are also deemed to have been stolen.

Unauthorized access, means access to paper or electronic records by an external party who is not entitled to have access to the records, and includes breaches of electronic database security. Improper access by Regional staff is subject to this procedure if it is concluded that the access was intentional, malicious or clearly made in bad faith, and the staff member had no professional need to access or use the personal information or personal health information.

In cases where personal information or personal health information records cannot be located, but it is reasonable that the records are still within the custody or control of the Region (e.g. a misfiled record); staff may choose to apply this procedure. The director of the affected program will decide whether to notify affected individuals.

Responsibility

The appropriate MFIPPA or PHIPA contact person is responsible for assisting the affected manager, director, or commissioner in applying this procedure. See the Information Access and Privacy Policy to determine the correct contact person.

The director of the affected program is responsible for ensuring the procedure is followed by staff after the privacy breach has been discovered.

The affected commissioner and/or contact person may take additional measures, in cases where a privacy breach is deemed to have serious impacts on affected individuals, or may have implications for the public profile, reputation, credibility or liability of the Region.

All staff are responsible for using appropriate security practices for personal information and personal health information in their control or possession, particularly if the records are removed from work sites. Refer to the Handling Information Outside of Region Premises Procedure for direction on protecting information from loss, theft and unauthorized access when outside regular Regional premises.

PROCEDURES:

General Privacy Breach Procedure for All Situations

1. When a possible privacy breach is discovered, Regional staff will notify their immediate supervisor or manager. The supervisor or manager will notify the relevant director(s) and review the Privacy Breach Protocol.
2. Loss or theft of electronic records or mobile devices containing personal information or personal health information must also be reported immediately to the ITS Service Desk.
3. Where appropriate, containment measures will be taken immediately to prevent the additional loss, theft or unauthorized access to the records.
4. Where possible, measures to retrieve compromised records will be taken.
5. The director of the affected program will notify the appropriate MFIPPA or PHIPA contact person about the incident.
6. The MFIPPA or PHIPA contact person will form a Privacy Breach Response Team with membership appropriate to the situation in order to investigate, derive a notification strategy, develop remediation procedures to prevent a reoccurrence, and take other steps based on the circumstances of the breach.
7. The MFIPPA or PHIPA contact person will notify the responsible commissioner and Regional Clerk of the situation. If the situation is one which is likely to become known to the media or public, the contact person will also inform the Chief Administrator's Office and relevant communications staff.

Lost or Stolen Privacy Breach Procedure

1. The Privacy Breach Response Team struck by the MFIPPA or PHIPA contact person will review the facts and information flow leading up to the loss or theft.
2. The Privacy Breach Response Team will establish a list of individuals who are affected by the loss or theft.
3. The Privacy Breach Response Team will derive a notification strategy, based on the type of breach, the client group affected and the number of individuals affected.
4. Notification strategies may include individual letters, verbal notification, or public notices placed in facilities, website content or other media if the identity of affected individuals cannot be positively determined (Appendix B contains a template for the contents of a notification letter).

5. Where separate notifications are to be given to individuals, the notices will be provided as soon as possible, but in all cases within 30 days of confirmation of the discovery of the breach.
6. After completion of the review and notification, the affected program's supervisor will create or update a Privacy Breach Incident Report form to assist in assessing patterns or procedural improvements.

Unauthorized Access to Electronic Records Privacy Breach Procedure

1. If electronic databases containing personal information or personal health information are breached by external parties, in addition to the above procedures, the MFIPPA or PHIPA contact person will include Information Technology Services staff in the Privacy Breach Response Team and response processes.

Reporting a Privacy Breach to the Information and Privacy Commissioner

1. The Information and Privacy Commissioner (IPC) will investigate privacy breaches and make recommendations either if a complaint is submitted by an affected individual, or if a municipality subject to MFIPPA or PHIPA asks for the IPC's involvement.
2. The MFIPPA contact person will decide whether a personal information breach will be reported to the IPC, but will notify the Regional Clerk prior to making a report.
3. The MFIPPA contact person will decide to report based on the following factors:
 - Whether the privacy breach is limited or significant in scale
 - The relative sensitivity of the personal information that was breached
 - The likelihood that an affected individual will make a separate complaint to the IPC
 - The likelihood that an affected individual will complain to Regional Councillors about the privacy breach
 - The privacy breach is likely to be known to the public
 - Whether the IPC may be able to provide direction which will assist the Region in handling the situation
 - Whether the Region has already identified or taken all possible and reasonable steps to handle the situation adequately
4. The PHIPA contact person is required to report a personal health information breach to the IPC if it falls into one of the following seven categories:
 - Use or disclosure without authority, meaning the person committing the breach knew or ought to have known that their actions are not permitted under PHIPA
 - Stolen information if it wasn't de-identified or properly encrypted
 - Further use or disclosure without authority is expected to continue

- Even if the breach is accidental or insignificant by itself, it must be reported if it is part of a pattern of similar breaches
- If you revoke, suspend or restrict the privileges or affiliation of a staff member as a result of a breach and the staff member is a member of a health regulatory college; or a staff member who is part of a health regulatory college voluntarily restricts their privileges or affiliation and you believe this action is related to a breach
- If disciplinary action is taken against a non-health regulatory college staff member
- A significant breach that involves either sensitive personal health information; a large volume of information; many individuals' information; or more than one health information custodian was responsible for the breach

Regional Records Held by External Agencies

1. The Region often provides copies of personal information or personal health information records to external agencies as allowed under MFIPPA (e.g. SAMS) or PHIPA (e.g. Panorama). Under these legislations, the Region may be deemed to retain control over the records even if they are in the possession of a different institution. If the Region is notified by an external agency that Regional records have been breached, the Region may take actions.
2. The relevant staff should notify the applicable MFIPPA or PHIPA contact person of the situation.
3. The MFIPPA or PHIPA contact person will consult with the relevant manager or director, and a course of action will be decided. Note if the breach involves more than one health information custodian it is mandatory to report to the IPC under PHIPA. The individuals affected by the external agency's actions may be notified of the privacy breach based on the following factors:
 - The records that are affected are clearly identifiable as Regional records
 - The likelihood that the records have been lost or stolen outside of the agency's premise
 - The external agency's willingness to notify the individuals directly
 - The sensitivity of the records
 - The possible impact on the public's confidence in Regional services

Post-Notification Steps

1. If the privacy breach is likely to result in damages to the affected individual, notify the Legal Services Division so that liability issues can be discussed and to make the Regional Solicitor aware of the possibility of an insurable claim or litigation.

2. The applicable MFIPPA or PHIPA contact person adds the incident to a separate index containing information about privacy breach incidents to allow trends or analysis of process gaps to occur.
3. The PHIPA contact persons are required to report privacy breach statistics annually to the IPC.

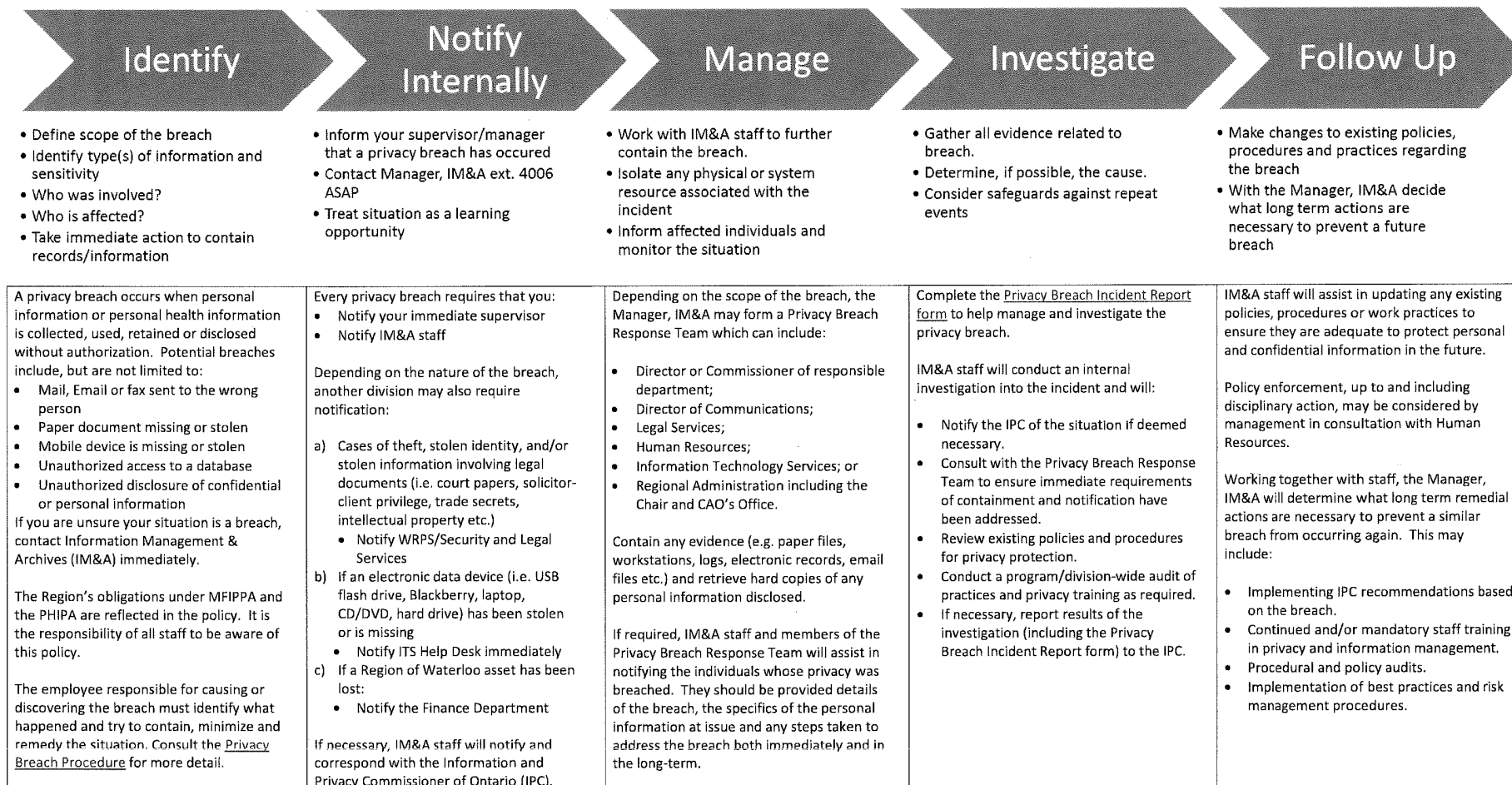
SEE ALSO:

- Human Resources Policy I-4 - Confidential Information ([DOCS #41657](#))
- Human Resources Policy I-6 - Use of Information Technology ([DOCS #41658](#))
- Human Resources Policy I-8 - Code of Ethics and Conflict of Interest ([DOCS #41840](#))
- Human Resources Policy I-25 - Fraud, Theft, Illegal And Dishonest Acts ([DOCS #41681](#))
- Human Resources Policy I-28 - Disciplinary Action ([DOCS #41684](#))
- Human Resources Policy I-35 - Discovery and Reporting of Serious Wrongdoing ([DOCS #41692](#))
- Information Access and Privacy Policy ([DOCS #2556731](#))
- Handling Information Outside of Region Premises Information Privacy Procedure ([DOCS #1704109](#))
- Employee's Guide to the Municipal Freedom of Information and Protection of Privacy Act ([DOCS #2017230](#))
- Region of Waterloo Confidentiality/Privacy Breach Protocol ([DOCS #1638090](#))
- Region of Waterloo Privacy Incident/Breach Tracking Form ([DOCS #1933087](#))
- [Municipal Freedom of Information and Protection of Privacy Act](#)
- [Privacy Breach Protocol Guidelines for Government Organizations](#)
- [How to Protect Personal Information in the Custody of a Third Party](#)
- ROWPHE Lost/Stolen Personal Health Information & Unauthorized Access ([DOCS #677897](#))
- ROWPHE Confidentiality/Privacy Breach Protocol ([#874719](#))
- ROWPHE Confidentiality/Privacy Breach Incident Reporting Form ([#874202](#))
- Senior's Services Personal Health Information Protection Procedure Manual ([DOCS #1446339](#))
- [Personal Health Information Protection Act](#)
- [Guidelines for the Health Sector Reporting a Privacy Breach to the Commissioner](#)
- [Detecting and Deterring Unauthorized Access to Personal Health Information](#)

APPENDIX A



Privacy Breach Protocol



APPENDIX B – TEMPLATE FOR NOTIFICATION LETTER CONTENTS

Introduction

- Clearly identify the Region as the responsible organization
- Identify the Region's commitment to maintaining the privacy of personal information or personal health information and complying with legal privacy requirements
- Identify MFIPPA or PHIPA as the relevant legislation

Sample Text for Illustration Only

The Region of Waterloo is committed to maintaining the privacy of the [personal information / personal health information] it holds about members of the public who use its services. The Region of Waterloo places a high value on complying with Ontario's information privacy legislation, called the [Municipal Freedom of Information and Protection of Privacy Act (MFIPPA) / Personal Health Information Protection Act (PHIPA)]. [MFIPPA / PHIPA] requires [municipalities / health information custodians] to inform affected individuals if their [personal information / personal health information] has been lost, stolen or accessed by unauthorized persons.


Identifying the purpose of contacting the individual

- Identify the specific program or office which held the information and the type of record which relates to the individual
- Concisely explain the reason why you believe the individual's personal information or personal health information has been lost, stolen or accessed by unauthorized persons
- In general terms identify the sensitivity of the compromised information

Sample Text for Illustration Only

Your [personal information / personal health information] was held by the [identify program]. The personal record consists of _____. Explain how the loss was identified e.g. 'during an audit of closed files staff discovered that your records could not be located,' or 'a briefcase containing your records was stolen from staff on...'

- Inform the individual about the Region's response to the privacy breach
- Briefly identify the steps taken by staff when the breach was discovered, including any efforts to contain the breach or prevent future breaches
- Inform the individual if the IPC was notified of the breach by the Region
- If the breach was serious, advise the individual of the remedies they can exercise (e.g. complaint made to the IPC)
- Apologize for the breach

 CORPORATE RESOURCES POLICY		Section #	Policy #
		7	14.7
		Approval Date: xxxx	Revision Date: xxxx
Title:	Freedom of Information Request Procedure		
Responsibility:	Council & Administrative Services	Approval Level:	
Applies to:	All Staff		

POLICY STATEMENT:

The Region of Waterloo is committed to being open, accessible and transparent while maintaining the privacy of personal information, personal health information, and confidential information in its custody and control.

Providing access to records and protecting privacy are legislated obligations under the Municipal Freedom of Information and Protection of Privacy Act (MFIPPA) and Personal Health Information Protection Act (PHIPA).

Regional records are public documents, subject to limited legislative exemptions, and are available for review in accordance with established procedures.

PURPOSE:

This procedure provides direction for the handling of written requests made under MFIPPA and PHIPA.

OPERATING DETAILS:

Municipal Freedom of Information and Protection of Privacy Act

Under MFIPPA, individuals may request their personal information or general information which is in the custody or control of the Region. The right to request information also applies to information supplied by a third party. The requester's right of access has some limitations, and the limits apply equally to information provided to the Region by a third party.

Personal Health Information Protection Act

Under PHIPA, individuals may request their personal health information which is in the custody or control of the Public Health and Emergency Services Department or Sunnyside Home. This also applies to personal health information supplied by a third party health care

provider. The requester's right of access has some limitations, and the limits apply equally to personal health information provided by a third party health care provider.

General

MFIPPA and PHIPA specify the process that the Region must follow for handling freedom of information requests. Prescribed items relate to response deadlines, content of correspondence, and fees.

The requester has a right to complain to the Information and Privacy Commissioner (IPC) about the handling of the request and response, regardless of the outcome. The IPC is authorized to investigate a complaint and order the Region to take actions it deems necessary to uphold the requester's right of access.

Requesters' identities are protected and are only disclosed when there is a clear need in order to facilitate a request or as required by legislation. Access decisions in response to requesters exercising their right to access Regional information will be made in a consistent manner regardless of the requesters' identity.

In this procedure, the term, "requester," includes the requester's substitute decision-maker as defined in the Information Access and Privacy Policy.

Responsibility

The MFIPPA and PHIPA contact persons are responsible for all written requests made under the corresponding legislation. The contact persons may either handle the request directly or provide direction to Regional staff for replying to the individual. The contact persons may engage Regional staff in the assistance of handling freedom of information requests.

All Regional staff that have custody or control of responsive records must follow all directions given by the contact persons. The contact persons may direct any staff to produce records for review, to copy or prepare them for release, to draft correspondence or other records, to provide a written statement documenting efforts to locate records or explaining the reason why records cannot be located. The contact persons may require staff to comply with deadlines, or take any other actions that are necessary to comply with MFIPPA and PHIPA requirements for providing access to records.

If an information request includes both personal information / general information and personal health information, the applicable MFIPPA and PHIPA contact persons will agree upon who is responsible for handling the request.

PROCEDURES

1. Request Intake

The staff member who receives the freedom of information request marks the date of receipt and notifies the appropriate MFIPPA or PHIPA contact person on the day the request is received. See the Information Access and Privacy Policy to determine the appropriate contact person.

If the request is for access to limited and specific information (e.g. Ontario Works client file, ambulance call report), the MFIPPA or PHIPA contact person may direct the relevant staff to respond directly to the request according to a specific routine disclosure process. The contact person may delegate ongoing responsibility to specific Regional staff for handling requests which are frequent, and which pertain to commonly collected information which would not be subject to any limitations on access in MFIPPA or PHIPA. The delegation may contain conditions or other requirements.

For all other freedom of information requests, the appropriate MFIPPA or PHIPA contact person reviews the request to ensure it includes the name, address and signature of the requester and the date received by the Region. A file is opened for each request. The contact person may notify the requester that the request has been received and is being handled under MFIPPA or PHIPA.

The MFIPPA or PHIPA contact person informs the manager(s) of the program which hold(s) the records to locate and provide the records, under a specific deadline. The contact person may notify the relevant director(s) and commissioner(s) of the request, depending on the request circumstances.

All staff who have knowledge of the request must maintain the confidentiality of the request and identity of the requester, except as necessary to handle and respond to the request.

2. Request Handling

The appropriate contact person will review the requested records and judge whether any of the exemptions on access in MFIPPA or PHIPA apply. The contact person consults with other Regional staff as needed to clarify the application of any exemptions on access.

The contact person prepares and issues a fee estimate if applicable. Fees are calculated according to the schedule contained in either MFIPPA (R.R.O. 1990 Regulation 823 6.1) or section 54(10) of PHIPA. The contact person may waive the fees after considering the circumstances of the request.

The contact person prepares the decision letter ensuring that the contents include all elements required by MFIPPA or PHIPA. The contact person will provide sufficient detail in the letter to explain the reason why any requested information has not been provided, or to explain any particular action taken by the Region in handling the request.

The contact person will take any appropriate steps to confirm the identity of the requester before providing copies of records. The contact person may require the requester to collect the response in person and produce satisfactory identification.

3. Request to View Records

Requesters may ask to view records in place of receiving a copy. Requesters may also ask for copies of specific parts. The appropriate MFIPPA or PHIPA contact person will follow the above procedures and make arrangements to permit the requester to view the responsive records.

If any record or part is protected by the exemptions on access in MFIPPA or PHIPA, the contact person will prepare a redacted copy of the original for viewing.

Original records that are viewed must remain under the control of Regional staff during review. The contact person may direct a manager to take appropriate steps to set up a viewing appointment and assign staff to monitor the records during the viewing. The viewing must be arranged in a location that reasonably respects the privacy of the requester and the records.


4. Statistical Tracking

The contact persons will ensure that written requests made under MFIPPA and PHIPA are tracked to allow the Region to comply with the annual MFIPPA and PHIPA request submission to the IPC.

SEE ALSO:

- Fees and Charges By-Law 07-027 ([DOCS #420321](#))
- Information Access and Privacy Policy ([DOCS #2556731](#))
- Employee's Guide to the Municipal Freedom of Information and Protection of Privacy Act ([DOCS #2017230](#))
- Guide to Electronic, Paper and other Records Searches ([DOCS #2431222](#))
- Freedom of Information Records Search Form ([DOCS #2443471](#))
- Freedom of Information Request Fee Estimate Form ([DOCS #2443472](#))
- [Municipal Freedom of Information and Protection of Privacy Act](#)
- [Routine Disclosure/Active Dissemination of Government Information](#)
- [Frivolous and Vexatious Requests Fact Sheet](#)
- [Reasonable Search Fact Sheet](#)
- [MFIPPA Statistical Report Workbook and Completion Guide](#)
- [MFIPPA Index of Records Form](#)
- [MFIPPA Request Form](#)
- [MFIPPA Appeal Form](#)
- [Authorization to Act as an Agent for Appeal Form](#)

- ROWPHE Access Requests for Personal Health Information ([DOCS #678278](#))
- Senior's Services Personal Health Information Protection Procedure Manual (DOCS #1446339)
- [Personal Health Information Protection Act](#)
- [Responding to a Request for Access to Personal Health Information Practice Direction](#)
- [Clarifying Access Requests PHIPA Practice Direction](#)
- [PHIPA Statistical Report Workbook and Completion Guide](#)
- [IPC Request to Access Personal Health Information Form](#)

 CORPORATE RESOURCES POLICY		Section #	Policy #
		7 Approval Date: xxxx	14.9 Revision Date: xxxx
Title:	Requests for Information Correction Procedure		
Responsibility:	Council & Administrative Services	Approval Level:	
Applies to:	All Staff		

POLICY STATEMENT:

The Region of Waterloo is committed to being open, accessible and transparent while maintaining the privacy of personal information, personal health information, and confidential information in its custody and control.

Providing access to records and protecting privacy are legislated obligations under the Municipal Freedom of Information and Protection of Privacy Act (MFIPPA) and Personal Health Information Protection Act (PHIPA).

Regional records are public documents, subject to limited legislative exemptions, and are available for review in accordance with established procedures.

PURPOSE:

This procedure provides direction for the handling of written requests for correction of personal information made under subsection 36(2) of MFIPPA or of personal health information made under section 55 of PHIPA and submitted by the individual who relates to the information, or by their substitute decision-maker. The definition for who can act as a substitute decision-maker can be found in the [Information Access and Privacy Policy](#).

OPERATING DETAILS:

General

Under MFIPPA and PHIPA, individuals may request correction of their information if they believe the record is inaccurate or incomplete. If a correction request is refused, the requester may ask that a statement of disagreement be attached to the record to reflect any correction that was requested but not made. The requester has a conditional right to ask that persons who have used the information within the last year be notified of the correction or statement of disagreement.

Complementing the MFIPPA or PHIPA right to request correction, the Region has an obligation to ensure that personal information and personal health information in its custody is as accurate, complete and up-to-date as necessary for the purposes that the information is used by staff.

This procedure is intended for formal correction requests, submitted by individuals who assert their right to request correction of information under MFIPPA or PHIPA. Minor corrections, like: correct spellings of names; errors in birth dates; address changes; or other amendments to individual's basic information may be handled directly by program staff, provided that reasonable steps, in the circumstances, are taken to verify the authenticity of the correction.

Responsibility

The appropriate MFIPPA or PHIPA contact person is responsible for handling written requests for correction of information made under MFIPPA and PHIPA.

All Regional staff that have custody of the requested personal information or personal health information records must assist the contact person, as necessary. Required assistance includes:

- providing information about the requester's involvement with the program that holds the personal information or personal health information which is subject to the request;
- discussing options for correcting the personal information or personal health information, or adopting alternate approaches to satisfying the requester's concerns;
- taking all agreed upon or required actions deemed necessary by the contact person to resolve the request; and
- taking actions which are ordered by the Information and Privacy Commissioner following an appeal of a correction request.

If a request for correction includes both personal information and personal health information, the applicable MFIPPA and PHIPA contact persons will agree upon who is responsible for handling the request.

PROCEDURES:

1. Information Correction Request Intake

The staff member who receives a written correction request marks the date of receipt and notifies the appropriate MFIPPA or PHIPA contact person on the day the request is received. See the Information Access and Privacy Policy to determine the appropriate contact person.

The contact person reviews the request to ensure it includes the name, address and signature of the requester and the date received. A file is opened for each request. The designate may notify the requester that the request has been received and is being handled under MFIPPA or PHIPA.

The contact person reviews the wording of the request to determine the nature of the correction, whether or not the request is for the correction of inaccurate or incomplete personal information or personal health information, and whether the requester has supplied documentation or information to support the correction request. If the request contains insufficient information or does not relate to inaccurate or incomplete personal information or personal health information, the contact person attempts to clarify the request or to ask that it be amended to relate to a change in inaccurate or incomplete personal information or personal health information.

The contact person informs the manager of the program that holds the relevant record about the request and asks for the original records affected by the request. The contact person may notify the relevant director, or commissioner of the correction request, depending on the circumstances.

All staff who have knowledge of the request must maintain the confidentiality of the request and identity of the requester, except as necessary to handle and respond to the request.

2. Correction Request Handling

The appropriate MFIPPA or PHIPA contact person reviews the relevant records and makes the following determinations:

- whether the record of personal information or personal health information was originally obtained from or supplied by the requester;
- whether the subject personal information or personal health information was recorded by Regional staff based on contact with the requester, or whether it was obtained from, or based on information supplied by a third party;
- whether the personal information or personal health information was properly collected and recorded under MFIPPA or PHIPA;

- whether the information consists of objective or factual personal information or personal health information or whether it consists of subjective information, like opinions evaluations or assessments;
- whether subjective personal information or personal health information is supported or unsupported by objective information recorded in the requester's records;
- whether the information appears to be incomplete relative to the normal extent that personal information or personal health information would be recorded for the type of service provided;
- whether the record is held in an active or closed file or database;
- the anticipated future uses or users of the record containing the personal information or personal health information;
- whether the record is in a file or database which may be legally accessed by other organizations without the consent of the requester;
- whether there is actual or potential litigation related to the personal information or personal health information;
- the impact of any directives from a responsible provincial ministry pertaining to the record or database which holds the personal information or personal health information; and
- other pertinent facts that are unique to the record or the request.

The contact person reviews the circumstances of the correction request and the above factors with the manager of the affected program, and other staff as appropriate. An objective analysis is to be used to make a decision on granting or refusing a correction request.

3. Factors For Granting or Refusing a Correction Request

Each correction request will have unique circumstances that will dictate the outcome. The factors listed above will influence the final decision in the following ways:

- Corrections to records supplied by or obtained from the requester may be appropriate if supported by valid or verifiable information from the requester.

- If the personal information or personal health information was supplied by a third party, there is no obligation in MFIPPA or PHIPA to correct the record. Referring the requester to the provider of the information is appropriate.
- MFIPPA and PHIPA set a number of conditions for the collection of personal information and personal health information (e.g. must support a lawful purpose, may require consent, limitations on indirect collection, etc.). If it appears that the record was not collected properly, correction may be appropriate.
- The right to request correction normally relates to factual or objective information. Substitution of the requester's opinions or subjective information for that recorded by Regional staff is not normally provided for.
- Corrections to subjective information may be considered where the information is unsupported by factual or objective information, and there are reasons to believe that the information is inherently unfair and may disadvantage the requester if it remains in the record.
- Additions to clarify the personal information or personal health information may be considered where the level of detail or notation is clearly less than would normally exist under recording practices used for other clients in similar circumstances.
- Where personal information or personal health information is directly relevant to the requester's services from the Region or another service provider, corrections may be considered. Alternate approaches may be considered such as an addendum to a record, or a withdrawal of consent.
- Corrections are generally not considered for closed records unless there is a likelihood that the information will be used in the future.
- If the record subject to the correction request is part of an active or semi-active file and will reasonably be used in the future, then the requester may have the option to withdraw consent from future uses of the personal information or personal health information.
- Records or databases which are accessible by other organizations without consent (e.g. SAMS) increase the potential impact of inaccurate personal information or personal health information, which may be a factor supporting correction.
- Corrections are refused if there is actual or potential litigation, because records may be used in evidence.

- Ministry directives regarding records, their retention or whether they may be audited may preclude corrections.

4. Decision Making

The appropriate MFIPPA or PHIPA contact person is responsible for granting or refusing a correction request or taking other appropriate steps to resolve the request. The contact person will consider all of the above factors in making a decision. In the event of a disagreement between the contact person and the program manager responsible for the record, the contact person will notify the appropriate MFIPPA or PHIPA head who will make the final decision.

5. Request Resolution

The contact person will follow the prescribed response process in subsection 36(2) of MFIPPA or section 55 of PHIPA. If the correction is refused the response will contain a clear explanation of the reasons for the decision.

If a correction is refused, the designate may discuss the response with the requester to determine if alternate approaches may apply, such as a withdrawal of consent to future use or disclosure of the information, or approaches to applying a statement of disagreement to the record. If a statement of disagreement is applied, make reasonable efforts to disclose the statement to anyone to whom the information was disclosed within the year before the correction was requested. The requester may appeal a refusal to the Information and Privacy Commissioner.

The manager of the program responsible for the record will ensure that any subsequent actions are implemented.


6. Statistical Tracking

The contact persons will ensure that written correction requests and outcomes are tracked to allow the Region to comply with the annual MFIPPA and PHIPA request submission to the Information and Privacy Commissioner.

SEE ALSO:

- Information Access and Privacy Policy ([DOCS #2556731](#))
- Employee's Guide to the Municipal Freedom of Information and Protection of Privacy Act ([DOCS #2017230](#))

- Municipal Freedom of Information and Protection of Privacy Act
- MFIPPA Statistical Report Workbook and Completion Guide
- MFIPPA Correction Request Form
- ROWPH Requests for the Correction of Personal Health Information (DOCS #677383)
- ROWPHE Correction of Personal Health Information Request Form (DOCS #1501549)
- Senior's Services Personal Health Information Protection Procedure Manual (DOCS #1446339)
- Personal Health Information Protection Act
- IPC Request to Correct Personal Health Information Form
- PHIPA Statistical Report Workbook and Completion Guide

 CORPORATE RESOURCES POLICY		Section #	Policy #
		7 Approval Date: xxxx	14.10 Revision Date: xxxx
Title:	Privacy Complaint Procedure		
Responsibility:	Council & Administrative Services	Approval Level:	
Applies to:	All Staff		

POLICY STATEMENT:

The Region of Waterloo is committed to being open, accessible and transparent while maintaining the privacy of personal information, personal health information, and confidential information in its custody and control.

Providing access to records and protecting privacy are legislated obligations under the Municipal Freedom of Information and Protection of Privacy Act (MFIPPA) and Personal Health Information Protection Act (PHIPA).

Regional records are public documents, subject to limited legislative exemptions, and are available for review in accordance with established procedures.

PURPOSE:

This procedure provides guidance on responding to complaints from clients of Regional services or other individuals about the handling of their personal information or personal health information. Complaints may be made directly to the Region or Information and Privacy Commissioner (IPC).

OPERATING DETAILS:

A key privacy principle is the right of individuals to complain about a perceived mishandling of personal information or personal health information resulting in a violation of privacy. MFIPPA and PHIPA's complaint processes involve the IPC as the oversight body. However, it is also possible that complainants may direct their concerns to the Region directly, and may omit the involvement of the IPC.

1. In this policy, a "complaint" includes:

- A concern, objection or disagreement primarily related to the collection, use, disclosure, handling, security, retention or disposal of personal information or personal health information by the Region.
- A concern, objection or disagreement made directly to Regional staff.
- A concern, objection or disagreement made directly to the IPC, and then referred to the Region by the IPC for an investigation and response.

2. In this policy a “complainant” includes:

- A client of Regional services.
- An individual whose personal information or personal health information has been handled by the Region.
- A Regional staff member, with respect to the collection, use, disclosure, handling, security, retention or disposal of employment-related personal information.

3. This policy excludes:

- Complaints regarding a refusal to provide access to personal information or personal health information under the applicable privacy legislation. Procedures for handling these forms of complaints are prescribed in the legislation under the appeal process.
- Complaints regarding a refusal to correct personal information or personal health information under the applicable privacy legislation. Procedures for handling these forms of complaints are prescribed in the legislation under the appeal process.
- Concerns, objections or disagreement about the delivery of Regional services where the handling of personal information or personal health information is only a minor or clearly secondary issue in the comments made by the affected individual. Regional internal practices for complaints will be followed.

PROCEDURES:

Complaints Made Directly to the Region

1. Intake by Staff

Complaints may be made directly to the staff member who was involved in the affected service and handling of information. You may ask the complainant to formally document the complaint in the Collection, Use and Disclosure of Personal Information Complaint form. Staff may attempt to resolve the complaint to the satisfaction of the complainant, or may re-direct the complaint to a manager or to the MFIPPA or PHIPA contact person if it is reasonable in the circumstances (e.g. the staff member is alleged to have mishandled the personal information or personal health information and the complainant implies that the

complaint should be handled elsewhere in the Region). See the Information Access and Privacy Policy to determine the appropriate contact person.

2. Action by Staff

Staff may take reasonable steps to resolve the complaint. Actions include reviewing activities connected to the perceived violation of privacy, reviewing records, audit trails or other documentation to determine the chain of control related to the personal information or personal health information, and assessing or implementing revised procedures to resolve a reasonable concern about the soundness of existing practices.

3. Disclosure of Complainant Information

In every complaint, staff shall not disclose the identity of the complainant unless necessary to handle and respond to the complaint. Despite the adversarial nature of a complaint, the complainant shall not be unreasonably disadvantaged or be denied continued or future Regional services. Unauthorized disclosure of complainant identity or details may result in a further breach or complaint or increase in liability of the Region.

4. Notification Concerning Complaints

The manager responsible for the service that is the subject of the complaint shall notify the appropriate MFIPPA or PHIPA contact person of any complaint that is:

- Resolved to the satisfaction of the complainant
- Unresolved, but the complainant does not wish to escalate the complaint
- Suspended, due to the inability to contact or follow-up with the complainant

The contact person will maintain a record of the nature of the complaint and subsequent actions to assist in the implementation of best practices in all Regional functions. The identity of the complainant will not be retained in records of resolved complaints.

5. Notification Concerning Unresolved or Suspended Complaints

The manager responsible will notify the appropriate MFIPPA or PHIPA contact person and provide information related to the reason the complaint is not resolved. The contact person will maintain a record of unresolved complaints, including the identity of the complainant, in the event that a subsequent investigation is commenced by the IPC.

6. Actions Related to Complaints Not Resolved by the Responsible Manager

The appropriate MFIPPA or PHIPA contact person will review the nature of the complaint to determine if there are any amendments to practices or procedures which would mitigate any reasonable concerns raised in the complaint. The manager responsible will comply with requests for additional information made by the contact person and implement recommended changes in practice. The contact person will respond to the complainant to advise them of the outcome of the complaint, and provide a written response where appropriate or where requested by the complainant. The contact person will inform the complainant, in writing, of the complainant's right to submit the complaint to the IPC if it cannot be resolved.

7. Notifying the Information and Privacy Commissioner About a Complaint:

The MFIPPA or PHIPA contact persons may refer a complaint to the IPC where it is reasonable in the circumstances:

- The complaint reveals a serious failing of Regional practices or the judgment or actions of staff.
- The complaint relates to a contravention with wide-ranging implications for Regional practices.
- The complaint would have implications for the public profile or credibility of the Region.
- The complaint has been, or may be, brought to the attention of elected representatives.
- Referring the complaint would be an act of good faith related to the complainant's interests or the public standing or liability of the Region.
- The complainant has indicated that they will take legal action or will publicize the incident.

Complaints Made to the Information and Privacy Commissioner

Individuals may contact the IPC directly with any complaint about the handling of personal information or personal health information under applicable privacy laws. Individuals may also involve the IPC if the complaint has been made to the Region but not resolved to their satisfaction. The IPC has the power to investigate, impose deadlines for responses, publish the findings of an investigation, and issue a legally binding order for the Region to take specified actions.

1. Intake

The IPC will notify the MFIPPA or PHIPA contact person of any complaint which merits investigation (the IPC is permitted to screen out complaints on various grounds). In the event that another staff member of the Region receives notice of the complaint from the IPC, the complaint must be forwarded to the appropriate contact person immediately.

2. Regional Investigation Following Notification

The MFIPPA or PHIPA contact person will investigate the complaint according to this procedure. Staff will comply with any request to provide records or background information, and will follow any instruction or time limit identified by the contact person. The contact person will be the sole point of contact with the IPC, but additional staff may participate in any communications with the IPC along with the contact person. The contact person will involve Regional staff (e.g. Regional Solicitor) if needed to provide advice on handling the complaint.

3. Disclosure of Complainant Information

Restrictions on disclosing complainant identity or details apply in the same way as described above relating to complaints directed to the Region. The complainant shall not be unreasonably disadvantaged or be denied continued or future Regional services as a result of complaining to the IPC. Unauthorized disclosure of complainant identity or details may result in further sanctions imposed by the IPC.


4. Resolution of the Investigation and Complaint

The MFIPPA or PHIPA contact person, with the assistance of staff, will prepare any representations requested by the IPC. The contact person will facilitate any negotiated or mediated settlements. The contact person will ensure that staff complies with any IPC-ordered actions. The contact person will review IPC-recommended actions with the manager responsible, derive an appropriate action plan, and set a time frame for implementation if any actions are needed.

SEE ALSO:

- Human Resources Policy I-16 – Complaint Resolutions Process ([DOCS #41666](#))
- Human Resources Policy I-19 – External Complaints ([DOCS #41669](#))
- Information Access and Privacy Policy ([DOCS #2556731](#))
- Employee's Guide to the Municipal Freedom of Information and Protection of Privacy Act ([DOCS #2017230](#))
- [Municipal Freedom of Information and Protection of Privacy Act](#)
- Collection, Use and Disclosure of Personal Information Complaint form ([DOCS #2803226](#))
- [Maintaining the Confidentiality of Requesters and Privacy Complaints](#)
- [IPC MFIPPA Privacy Complaint Form](#)
- [Authorization to Act as an Agent for Privacy Complaint under MFIPPA](#)
- ROWPHE Complaints Regarding the Handling of Personal Health Information ([DOCS #678453](#))
- ROWPHE Collection, Use and Disclosure Complaint Form ([DOCS #1881129](#))
- Senior's Services Personal Health Information Protection Procedure Manual ([DOCS #1446339](#))
- [Personal Health Information Protection Act](#)

- Code of Procedure for Matters under PHIPA
- IPC PHIPA Collection, Use and Disclosure Complaint Form
- Authorization to Act as an Agent for a Complaint under PHIPA

 Corporate Resources Policy		Section #	Policy #
		7 Approval Date: xxxx	14.14 Revision Date: xxxx
Title:	Access and Privacy Roles and Responsibilities		
Responsibility:	Council & Administrative Services	Approval Level:	
Applies to:	All Staff		

POLICY STATEMENT:

The Region of Waterloo is committed to being open, accessible and transparent while maintaining the privacy of personal information, personal health information, and confidential information in its custody and control.

Providing access to records and protecting privacy are legislated obligations under the Municipal Freedom of Information and Protection of Privacy Act (MFIPPA) and Personal Health Information Protection Act (PHIPA).

Regional records are public documents, subject to limited legislative exemptions, and are available for review in accordance with established procedures.

PURPOSE:

This procedure assigns accountability for Regional compliance with MFIPPA and PHIPA. It sets the conditions for delegating authority to make decision or take any actions required under the corresponding legislation. It also establishes the roles staff provide in the handling of personal information and personal health information. All staff have a duty to ensure that their handling of all forms of information complies with the corresponding legislation.

OPERATING Details:

Delegation of Authority under MFIPPA

The Regional Clerk is accountable to Council for compliance with MFIPPA and will take reasonable steps to ensure that all staff handles personal information in compliance with MFIPPA. As set out in By-Law 04-92, the Regional Clerk is the head for the Region under MFIPPA.

Section 3 of MFIPPA allows municipalities to appoint a contact person to facilitate compliance with the legislation. The Regional Clerk has designated the Manager, Information Management & Archives to be the contact person for MFIPPA. The MFIPPA contact person reports directly to the Regional Clerk with regard to MFIPPA and may use the assistance of other staff to perform their duties.

Delegation of Authority under PHIPA

The Medical Officer of Health is accountable to the Board of Health for compliance with PHIPA and will take reasonable steps to ensure that all Public Health and Emergency Services Department (ROWPHE) staff handles personal health information in compliance with PHIPA. The Medical Officer of Health is known as the head for ROWPHE under PHIPA.

Section 15 of PHIPA requires health information custodians to appoint a contact person to facilitate compliance with the legislation. The Medical Officer of Health has designated the Director, Central Resources to be the PHIPA contact person for ROWPHE. The ROWPHE PHIPA contact person reports directly to the Medical Officer of Health with regard to PHIPA and may use the assistance of other ROWPHE staff to perform their duties.

The Chief, Paramedic Services is accountable to Council for compliance with PHIPA and will take reasonable steps to ensure that all Paramedic Services staff handles personal health information in compliance with PHIPA. The Chief, Paramedic Services is known as the head for Paramedic Services under PHIPA. The Chief, Paramedic Services is also the PHIPA contact person for Paramedic Services. The Paramedic Services contact person may use the assistance of other Paramedic Services staff to perform their duties.

The Director, Seniors' Services is accountable to Council for compliance with PHIPA and will take reasonable steps to ensure that all Sunnyside Home staff handles personal health information in compliance with PHIPA. The Director, Senior's Services is known as the head for Sunnyside Home under PHIPA. The Director, Senior's Services is also the PHIPA contact person for Sunnyside Home. The Sunnyside Home PHIPA contact person may use the assistance of other Seniors' Services staff to perform their duties.

Roles

Chief Administrative Officer will:

- Provide oversight and compliance with this policy by all Regional employees; and
- Promote a culture and business practices that ensures Regional information is shared and accessible to the greatest extent possible, while respecting privacy requirements of personal information, personal health information and other confidentiality obligations.

Regional Clerk and delegated staff will:

- Act as head/contact person under MFIPPA and be accountable for overseeing the administration of the legislation;
- Take adequate steps to provide or arrange awareness and education opportunities for staff which reflect their duties and program activities according to MFIPPA;
- Provide advice and assistance to staff on questions or issues that arise in regards to MFIPPA, or arrange for advice and assistance to be provided from other sources;

- Be responsible for the receipt, coordination, response and sign off for all formal freedom of information requests made under MFIPPA;
- Coordinate the response to complaints regarding the misuse of personal information;
- Investigate reports of privacy breaches involving personal information and communicate findings to the complainant and where appropriate the Information & Privacy Commissioner;
- Develop and implement policies on providing access to and the protection of personal information;
- Ensure that legislative updates to MFIPPA are incorporated into the Region's personal information collection, use and disclosure processes;
- Ensure that adequate information disposal processes are in place and adhered to;
- Conduct privacy audits of technologies that collect, use and disclose personal information;
- Advise on how to build privacy protection into the design and operation of the Region's programs and services that collect, use, and disclose personal information or personal health information;
- Conduct privacy impact assessments on technological systems or processes that involve the collection, use or disclosure of personal information or personal health information; and
- Be responsible for annual statistical reporting under MFIPPA to the Information & Privacy Commissioner.

Health Information Custodian delegated staff will:

- Act as head/contact person under PHIPA and be accountable for overseeing the administration of the legislation;
- Take adequate steps to provide or arrange awareness and education opportunities for staff which reflect their duties and program activities according to PHIPA;
- Provide advice and assistance to staff on questions or issues that arise in regards to PHIPA, or to arrange for advice and assistance to be provided from other sources;
- Be responsible for the receipt, coordination, response and sign off for all formal freedom of information requests made under PHIPA;
- Coordinate the response to complaints regarding the misuse of personal health information;

- Investigate reports of privacy breaches involving personal health information and communicate findings to complainant and where required the Information & Privacy Commissioner;
- Develop and implement policies and staff training on providing access to and protection of personal health information;
- Ensure that legislative updates to PHIPA are incorporated into personal health information collection, use and disclosure processes;
- Conduct privacy audits on technologies that collect, use and control personal health information;
- Build privacy protection into the design and operation of programs and services that collect, use and disclose personal health information;
- Participate in privacy impact assessments on technological systems or processes that involve the collection, use or disclosure of personal health information; and
- Be responsible for annual statistical reporting under PHIPA to the Information & Privacy Commissioner.

Director, Information Technology Services and ITS staff will:

- Design and provide technology and technical support to implement this policy;
- Conduct or coordinate threat risk assessments on all technological systems involving the collection or use of personal information or personal health information prior to implementation;
- Participate in privacy impact assessments on technology systems that involve the collection, use or disclosure of personal information or personal health information.
- Ensure appropriate technological safeguards are implemented in accordance with MFIPPA and PHIPA; and
- Work collaboratively with the Regional Clerk/delegates and Health Information Custodians to ensure information technology privacy and security related concerns are addressed.

Management will:

- Take reasonable steps to ensure that processes and practices for the handling of personal information or personal health information by their staff comply with MFIPPA or PHIPA;
- Implement this policy and communicate requirements to the employees under their direction;

- Inform employees of the legal and administrative consequences of any inappropriate or unauthorized access to, or collection, use, disclosure or disposition of, personal information or personal health information related to a particular program or activity;
- Ensure privacy impact assessments are conducted on any new programs, services or technologies involving the collection of personal information or personal health information prior to implementation;
- Ensure legislative requirements are met and documented in service agreements with third party contractors which involve the collection, use or disclosure of personal information or personal health information;
- Receive and act upon a report made by their staff which pertains to personal information or personal health information handling practices or processes which may not comply with MFIPPA or PHIPA; and

Employees, Students, Consultants and Volunteers will:

- Understand their responsibilities to provide access to information, as well as, protect privacy in executing their duties;
- Participate in applicable MFIPPA and PHIPA awareness and training opportunities;
- Familiarize themselves with and follow any Region or program-specific procedures which direct or affect the handling of personal information or personal health information;
- Assist individuals with access to information requests related to public records or routine disclosure procedures as required;
- Seek direction from a supervisor, manager, or appropriate MFIPPA or PHIPA contact person if it is unclear whether the collection, use, disclosure, or handling of information in their custody or control complies with MFIPPA or PHIPA;
- Upon discovery that personal information or personal health information in their custody or control has been lost, stolen or accessed by unauthorized persons, shall immediately notify their supervisor or manager;
- Cooperate to the fullest extent in any investigation related to loss, theft or unauthorized access to personal information or personal health information;
- Execute a Promise of Confidentiality agreement to acknowledge that some of the information they will handle or have access to is confidential and that they are required to keep that information confidential;
- Advise their immediate supervisor if their duties result in the collection, use, disclosure or handling of personal information or personal health information related to their

relatives, friends or neighbours and comply with any directions, restrictions or conditions on the handling of that information;

- Assist in the resolution of freedom of information requests or corrections that pertain to their program area by providing records, clarifying issues, documenting efforts to retrieve records, and complying with deadlines;
- Adhere to information management requirements contained in Information Management & Archives policies and procedures, including the Corporate Information Retention and Disposal Schedule by-law.

SEE ALSO:

- Human Resources Policy I-4 - Confidential Information ([DOCS #41657](#))
- Human Resources Policy I-6 - Use of Information Technology ([DOCS #41658](#))
- Promise of Confidentiality HR15 ([DOCS #240497](#))
- Information Management Accountability Operating Procedure ([DOCS #475462](#))
- Official Repository for Electronic Documents Operating Procedure ([DOCS #413485](#))
- Information Access and Privacy Policy ([DOCS #2556731](#))
- Employee's Guide to the Municipal Freedom of Information and Protection of Privacy Act ([DOCS #2017230](#))
- Corporate Information Retention and Disposal Schedule 2014 ([DOCS #888044](#))
- Municipal Freedom of Information and Protection of Privacy Act
- ROWPHE Accountability, Delegation of Authority, and Decision Making Procedure ([DOCS #663286](#))
- ROWPHE Accountability of ROWPHE Staff, Students and Volunteers Procedure ([DOCS #673244](#))
- Senior's Services Personal Health Information Protection Procedure Manual (DOCS #1446339)
- Personal Health Information Protection Act

7. Smart Cities Youth Petition Content

Appendix C

Help Waterloo region win the smart cities challenge!



Region of Waterloo started this petition to cabbott@regionofwaterloo.ca and 1 other

If you're 18 years old or younger, we need your support! Please sign and share this petition!

Did you know our community has been shortlisted for a one in five chance of winning \$50 million to improve the well-being of children and youth? That's right, we want to make our region THE BEST community in Canada for young people like you!

Last year the Federal Government launched the smart cities challenge, a national competition that encourages communities to come up with innovative technology solutions to their most pressing challenge.

Waterloo region is focusing on healthy children and youth with the goal of making our community the best in Canada for kids. We're working with children and youth to create new technologies and programs to help them see a positive future for themselves. We're also working with adults so all children and youth feel supported in school and the community. We'll share what we learn so all kids in Canada feel valued, heard and included.

To win the \$50 million to improve our community, we need to become the best community in Canada for children and youth.

This petition urges Infrastructure Canada (the leaders of the competition) to recognize the participation and support we have from local young people to win the smart cities challenge.

For more information visit www.smartwtr.ca. If you are older than 18, please share your ideas and input on our website.

Follow us @SmartWatRegion on Instagram and Twitter. Use #SmartWR #SmartCitiesCanada and #bestcommunityforkids when chatting on social media, and tag us in your posts!

2,117 have signed. Let's get to 2,500!

[View all signatures](#)

lakshanth T signed 2 hours ago

Elena Kik signed 4 hours ago

Help Waterloo region win the smart cities challenge! Sign the petition.

Share on Facebook

Send a Facebook message

Send an email to friends

Tweet to your followers

Copy link

Petition Copy

Title: Calling all young people! Help Waterloo region win the smart cities challenge!

Did you know that our community has been shortlisted for a one in five chance of winning \$50 million to improve the well-being of children and youth? That's right, we want to make our region THE BEST community in Canada for young people like you!

Last year, the Federal Government launched the smart cities challenge, a national competition that encourages communities to come up with innovative technology solutions to their most pressing challenge.

Waterloo region is focusing on healthy children and youth with the goal of making our community the best in Canada for kids. We're working with children and youth to create new technologies and programs to help them see a positive future for themselves. We're also working with adults so that all children and youth feel supported in school and the community. We'll share what we learn so all kids in Canada feel valued, heard and included.

To win the \$50 million to improve our community, we need to be the best community in Canada for children and youth.

This petition urges Infrastructure Canada (the leaders of the competition) to recognize the engagement and support we have from young people to win the smart cities challenge.

We need your support and your voice to help us become the best community in Canada for children and youth! Please sign and share this petition! Make Waterloo region a smart city.

For more information, and to provide your ideas and input, visit www.smartwr.ca.

Follow us @SmartWatRegion in Instagram and Twitter. Use #SmartWR #SmartCitiesCanada and #bestcommunityforkids when discussing this campaign on social media, and tag us in your posts!

Region of Waterloo

Recipient: sabbott@regionofwaterloo.ca , jkolb@regionofwaterloo.ca

Letter: Greetings,

Help Waterloo region win the smart cities challenge! Sign the petition.

Comments

Name	Location	Date	Comment	ATIA - 19(1)
	Waterloo, Canada	2019-01-18	WATERLOO IS THE BOMBBBB	
	Watello, Canada	2019-01-23	I live in Waterloo region I want the best for my children	
	Canada	2019-01-26	I want a better community	
	Kitchener, Canada	2019-01-26	This community is amazing !	
	Waterloo, Canada	2019-01-27	We have just moved to Waterloo and it has the best decision we have made!	
	Kitchener, Canada	2019-01-28	Signing on behalf of [REDACTED]	
	Kitchener, Canada	2019-01-28	I'd like Waterloo Region to be the best community for children and youth.	
	Cambridge, Canada	2019-01-28	Our children are the future	
	Waterloo, Canada	2019-01-28	[REDACTED]	
	kitchener, Canada	2019-01-28	i'm signing because [REDACTED] without extra effort she would be left behind	
	Kitchener, Canada	2019-01-28	I am signing on behalf of [REDACTED]	
	Canada	2019-01-29	KW rocks!!	
	Puerto Ordaz, Venezuela	2019-01-29	I signed by my [REDACTED]	
	Wroxeter, Canada	2019-01-30	To support our next generation!	
	Kitchener, Canada	2019-01-30	I love our community and want to see it continue to grow 'smartly' and prosperously.	
	Brampton, Canada	2019-01-30	I signed for [REDACTED]	
	Kitchener, Canada	2019-01-30	Signing because [REDACTED] generation of awesome change makers need to be supported to move toward a better future. #youthleaders #trustourkids	
	Kitchener, Canada	2019-01-31	I have kids and youth matter!	
	Waterloo, Canada	2019-02-01	Cool cause!	
	kitchener, ontario, Canada	2019-02-01	I believe in the abilities of our young people 💎	

Name	Location	Date	Comment
	Kitchener, Canada	2019-02-02	I want to help this cause
	Waterloo Region, Canada	2019-02-02	mental health is important.
	Kitchener, Canada	2019-02-02	I'm in Waterloo
	Cambridge, Canada	2019-02-02	My region, my city, my growth. Ultimately the whole community grows
	Kitchener, Canada	2019-02-02	I believe the growth of Waterloo Region is something worth fighting for!
	Kitchener, Canada	2019-02-02	
	Wasaga Beach, Canada	2019-02-03	
	Cambridge, Canada	2019-02-03	Let's get it
	Waterloo, Canada	2019-02-03	...
	Waterloo, Canada	2019-02-03	
	Campbell River, Canada	2019-02-04	Im signing because we need our future generations to be an improvement on our past. Happy to see the communities come together to work toward a better tomorrow.

Region of Waterloo

Recipient: sabbott@regionofwaterloo.ca , jkolb@regionofwaterloo.ca

Letter: Greetings,

Help Waterloo region win the smart cities challenge! Sign the petition.

Signatures

ATIA - 19(1)

Name

Location

Date

Canada

2019-01-18

Mississauga, Canada

2019-01-18

Waterloo, Canada

2019-01-18

Kitchener, Canada

2019-01-18

Waterloo, Canada

2019-01-18

Waterloo, Canada

2019-01-18

Waterloo, Canada

2019-01-18

Toronto, Canada

2019-01-18

Waterloo, Canada

2019-01-18

Waterloo, Canada

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Ontario, Canada

2019-01-18

Waterloo, Canada

2019-01-19

Waterloo, Canada

2019-01-19

Kitchener, Canada

2019-01-19

Waterloo, Canada

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Waterloo, Canada

2019-01-19

Kitchener, Canada

2019-01-19

Cambridge, Canada

2019-01-19

Kitchener, Canada

2019-01-19

Pickering, Canada

2019-01-19

Name**Location****Date**

Kitchener, Canada

2019-01-19

Kitchener, Canada

2019-01-19

Kitchener, Canada

2019-01-19

Markham, Canada

2019-01-19

Edmonton, Canada

2019-01-19

Waterloo, Canada

2019-01-19

Toronto, Canada

2019-01-19

Kitchener, Canada

2019-01-19

Cambridge, Canada

2019-01-19

Toronto, Canada

2019-01-19

Kitchener, Canada

2019-01-19

Cambridge, Canada

2019-01-19

Cambridge, Canada

2019-01-19

Cambridge, Canada

2019-01-19

Mississauga, Canada

2019-01-19

Kitchener, Canada

2019-01-19

Kitchener, Canada

2019-01-19

Kitchener, Canada

2019-01-19

Cambridge, Canada

2019-01-19

Thornhill, Canada

2019-01-19

Kitchener, Canada

2019-01-19

Cambridge, Canada

2019-01-19

Name	Location	Date
	Kitchener, Canada	2019-01-19
	Kitchener, Canada	2019-01-19
	Waterloo, Canada	2019-01-19
	Kitchener, Canada	2019-01-19
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	Waterloo, Canada	2019-01-19
	waterloo, Canada	2019-01-19
	Waterloo, Canada	2019-01-19
	Ottawa, Canada	2019-01-19
	New Hamburg, Canada	2019-01-19

Name	Location	Date
	Waterloo, Canada	2019-01-19
	Kitchener, Canada	2019-01-19
	Kitchener, Canada	2019-01-19
	Kitchener, Canada	2019-01-19
	Kitchener, Canada	2019-01-19
	Mississauga, Canada	2019-01-19
	Kitchener, Canada	2019-01-19
	Cambridge, Canada	2019-01-19
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	Kitchener, Canada	2019-01-19
	Edmonton, Canada	2019-01-19
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	Kitchener, Canada	2019-01-19
	Brantford, Canada	2019-01-19

Name**Location****Date**

	Toronto, Canada	2019-01-19
	Kitchener, Canada	2019-01-19
	Waterloo, Canada	2019-01-19
	Brampton, Canada	2019-01-19
	Mississauga, Canada	2019-01-19
	Burlington, Canada	2019-01-19
	Cambridge, Canada	2019-01-19
	Kitchener, Canada	2019-01-19
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	Brampton, Canada	2019-01-19
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Name**Location****Date**

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	Kitchener, Canada	2019-01-19
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	Kitchener, Canada	2019-01-19
	Waterloo, Canada	2019-01-19
	Kitchener, Canada	2019-01-19
	Toronto, Canada	2019-01-19
	North York, Canada	2019-01-19
	Toronto, Canada	2019-01-19
	Kitchener, Canada	2019-01-19
	waterloo, Canada	2019-01-19

Name**Location****Date**

	Kitchener, Canada	2019-01-19
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	Kitchener, Canada	2019-01-19
	Toronto, Canada	2019-01-19
	Toronto, Canada	2019-01-19
	Kitchener, Canada	2019-01-19
	North York, Canada	2019-01-19
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	Kitchener, Canada	2019-01-20
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	Kitchener, Canada	2019-01-20
	Waterloo, Canada	2019-01-20

Name**Location****Date**

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	Winnipeg, Canada	2019-01-21
	Waterloo, Canada	2019-01-21
	Waterloo, Canada	2019-01-21
	Burlington, Canada	2019-01-21
	Kitchener, Canada	2019-01-21
	Abbotsford, Canada	2019-01-21
	Waterloo, Canada	2019-01-21
	Markham, Canada	2019-01-22
	Toronto, Canada	2019-01-22
	Kitchener, Canada	2019-01-22
	Waterloo, Canada	2019-01-22
	Kitchener, Canada	2019-01-22

Name**Location****Date**

Kitchener, Canada

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Kitchener, Canada

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Watello, Canada

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Kitchener, Canada

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King City, Canada

2019-01-24

Toronto, Canada

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Waterloo, Canada

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Kitchener, Canada

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Saint John, Canada

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Waterloo, Canada

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Montréal, Canada

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Kitchener, Canada

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Breslau, Canada

2019-01-25

Thompson, Canada

2019-01-25

Waterloo, Canada

2019-01-25

Kitchener, Canada

2019-01-25

Name**Location****Date**

	Waterloo, Canada	2019-01-25
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	Cambridge, Canada	2019-01-25
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	Montréal, Canada	2019-01-26
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	Waterloo, Canada	2019-01-26
	Ottawa, Canada	2019-01-26
	Vaughan, Canada	2019-01-26
	Brantford, Canada	2019-01-26
	Wellesley, Canada	2019-01-26
	Waterloo, Canada	2019-01-26
	Kitchener, Canada	2019-01-26
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	Cambridge, Canada	2019-01-26
	Ayr, Canada	2019-01-26
	Ayr Ontario, Canada	2019-01-26

Name**Location****Date**

Cambridge, Canada

2019-01-26

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Kitchener, Canada

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Toronto, Canada

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Cambridge, Canada

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Waterloo, Canada

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Toronto, Canada

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New Hamburg, Canada

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Waterloo, Canada

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Milton, Canada

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Cambridge, Canada

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Markham, Canada

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Waterloo, Canada

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Cambridge, Canada

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Kitchener, Canada

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cambridge, Canada

2019-01-28

Name**Location****Date**

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	St Marys, Canada	2019-01-28
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Name	Location	Date
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	Cambridge, Canada	2019-01-28
	Toronto, Canada	2019-01-28
	Kitchener, Canada	2019-01-28
	North York, Canada	2019-01-28

Name	Location	Date
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	St Clements, Canada	2019-01-28
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	Toronto, Canada	2019-01-28
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	Kitchener, Canada	2019-01-28

Name	Location	Date
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	North York, Canada	2019-01-29
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	Waterloo, Canada	2019-01-29
	Kitchener, Canada	2019-01-29
	Cambridge, Canada	2019-01-29
	Puerto Ordaz, Venezuela	2019-01-29
	Kitchener, Canada	2019-01-29
	Kitchener, Canada	2019-01-29
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	Kitchener, Canada	2019-01-29
	Toronto, Canada	2019-01-29
	Waterloo, Canada	2019-01-29
	West Montrose, Canada	2019-01-29
	Waterloo, Canada	2019-01-29

Name	Location	Date
	Cambridge, Canada	2019-01-29
	Kitchener, Canada	2019-01-29
	Waterloo, Canada	2019-01-29
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	Ayr, Canada	2019-01-29
	Toronto, Canada	2019-01-29
	Waterloo, Canada	2019-01-29
	Kitchener, Canada	2019-01-30
	Baden, Canada	2019-01-30
	Kitchener, Canada	2019-01-30
	Kitchener, Canada	2019-01-30
	Wroxeter, Canada	2019-01-30
	Kitchener, Canada	2019-01-30
	San Antonio, Texas, US	2019-01-30
	Kitchener, Canada	2019-01-30
	Cambridge, Canada	2019-01-30
	New Hamburg, Canada	2019-01-30
	Ontario, Canada	2019-01-30

Name	Location	Date
	Waterloo, Canada	2019-01-30
	Cambridge, Canada	2019-01-30
	Cambridge, Canada	2019-01-30
	Cambridge, Canada	2019-01-30
	Cambridge, Canada	2019-01-30
	Cambridge, Canada	2019-01-30
	Maryhill, Canada	2019-01-30
	Kitchener, Canada	2019-01-30
	Cambridge, Canada	2019-01-30
	Cambridge, Canada	2019-01-30
	Ayr, Canada	2019-01-30
	Cambridge, Canada	2019-01-30
	Waterloo Region, Canada	2019-01-30
	Kitchener, Canada	2019-01-30
	Kitchener, Canada	2019-01-30
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	Cambridge, Canada	2019-01-30
	Cambridge, Canada	2019-01-30
	Waterloo, Canada	2019-01-30
	Kitchener, Canada	2019-01-30

Name	Location	Date
	Kitchener, Canada	2019-01-30
	Cambridge, Canada	2019-01-30
	Ayr, Canada	2019-01-30
	Mississauga, Canada	2019-01-30
	North York, Canada	2019-01-30
	Kitchener, Canada	2019-01-30
	Toronto, Canada	2019-01-30
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	Guelph, Canada	2019-01-30
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	Kitchener, Canada	2019-01-30

Name	Location	Date
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	Cambridge, Canada	2019-01-30
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	Elmira, Canada	2019-01-30
	Toronto, Canada	2019-01-30
	North York, Canada	2019-01-30
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	Cambridge, Canada	2019-01-30
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	Ontario, Canada	2019-01-30
	Kitchener, Canada	2019-01-30

Name	Location	Date
	KITCHENER, Canada	2019-01-30
	Cambridge, Canada	2019-01-30
	Cambridge, Canada	2019-01-30
	Brampton, Canada	2019-01-30
	Kitchener, Canada	2019-01-30
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	Cambridge, Canada	2019-01-30
	Waterloo, Canada	2019-01-30
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	Cambridge, Canada	2019-01-30
	Kingston, Canada	2019-01-30
	Cambridge, Canada	2019-01-30
	Kitchener, Canada	2019-01-30
	Toronto, Canada	2019-01-30
	Kitchener, Canada	2019-01-30
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	Kitchener, Canada	2019-01-30
	Waterloo, Canada	2019-01-30
	Kitchener, Canada	2019-01-30

Name**Location****Date**

	Kitchener, Canada	2019-01-30
	Kitchener, Canada	2019-01-30
	Cambridge, Canada	2019-01-30
	Kitchener, Canada	2019-01-30
	Toronto, Canada	2019-01-30
	Kitchener, Canada	2019-01-30
	Old Bridge, New Jersey, US	2019-01-30
	Kitchener, Canada	2019-01-30
	Kitchener, Canada	2019-01-30
	Hamilton, Canada	2019-01-30
	Waterloo, Canada	2019-01-30
	Kitchener, Canada	2019-01-30
	Kitchener, Canada	2019-01-30
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	Kitchener, Canada	2019-01-30
	Toronto, Canada	2019-01-30
	Cambridge, Canada	2019-01-30
	Kitchener, Canada	2019-01-30
	Waterloo, Canada	2019-01-30
	AYR, Canada	2019-01-30
	North York, Canada	2019-01-30

Name	Location	Date
	Waterloo, Canada	2019-01-30
	Toronto, Canada	2019-01-30
	Elmira, Canada	2019-01-30
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	Waterloo, Canada	2019-01-30
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	Cambridge, Canada	2019-01-30
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	Waterloo, Canada	2019-01-30
	Stratford, Canada	2019-01-30
	Waterloo, Canada	2019-01-30
	Toronto, Canada	2019-01-30
	Guelph, Canada	2019-01-30
	Waterloo, Canada	2019-01-30
	Cambridge, Canada	2019-01-30

Name	Location	Date
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	Kitchener, Canada	2019-01-30
	Kingston, Canada	2019-01-30
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	Waterloo, Canada	2019-01-30
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	Ayr, Canada	2019-01-30
	Kitchener, Canada	2019-01-30
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Name	Location	Date
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	Kitchener, Canada	2019-01-31
	Cambridge, Canada	2019-01-31
	Kitchener, Canada	2019-01-31

Name**Location****Date**

Kitchener, Canada

2019-01-31

Kitchener, Canada

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Kitchener, Canada

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Kitchener, Canada

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Toronto, Canada

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Kitchener, Canada

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North York, Canada

2019-01-31

Hamilton, Canada

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Kitchener, Canada

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Hamilton, Canada

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Waterloo, Canada

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Kitchener, Canada

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Waterloo, Canada

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toronto, Canada

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Toronto, Canada

2019-01-31

Name	Location	Date
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Name	Location	Date
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Name	Location	Date
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Name	Location	Date
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	Okotoks, Canada	2019-01-31
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	Waterloo, Canada	2019-02-01
	Brampton, Canada	2019-02-01
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Name	Location	Date
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Name	Location	Date
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Name	Location	Date
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Name	Location	Date
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Name	Location	Date
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	Waterloo, Canada	2019-02-01
	New Hamburg, Canada	2019-02-01

Name	Location	Date
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Name	Location	Date
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	Cambridge, Canada	2019-02-01
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	Toronto, Canada	2019-02-01
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Name	Location	Date
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Name	Location	Date
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	Toronto, Canada	2019-02-01
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	Kitchener, Canada	2019-02-01
	Ayr, Canada	2019-02-01
	Kitchener, Canada	2019-02-01
	Cambridge, Canada	2019-02-01
	Toronto, Canada	2019-02-01
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	Kitchener, Canada	2019-02-01
	Kitchener, Canada	2019-02-01
	Toronto, Canada	2019-02-01

Name	Location	Date
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	Kitchener, Canada	2019-02-01
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	Kitchener, Canada	2019-02-01
	Medellin, Colombia	2019-02-01
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	Cambridge, Canada	2019-02-01
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Name	Location	Date
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	Cambridge, Canada	2019-02-01
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	Waterloo, Canada	2019-02-01
	Kitchener, Canada	2019-02-01
	Etobicoke, Canada	2019-02-01
	Kitchener, Canada	2019-02-01
	North York, Canada	2019-02-01
	San Antonio, Texas, US	2019-02-01
	Cambridge, Canada	2019-02-01
	Cambridge, Canada	2019-02-01
	Cambridge, Canada	2019-02-01
	Burlington, Canada	2019-02-01

Name	Location	Date
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	Cambridge, Canada	2019-02-01
	Burlington, Canada	2019-02-01
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	Kingston, Canada	2019-02-01
	Cambridge, Canada	2019-02-01
	Waterloo, Canada	2019-02-01
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	Cambridge, Canada	2019-02-01
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	Cambridge, Massachusetts, US	2019-02-01
	Cambridge, Canada	2019-02-01
	Toronto, Canada	2019-02-01
	Waterloo, Canada	2019-02-01

Name	Location	Date
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	North York, Canada	2019-02-01
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	Toronto, Canada	2019-02-01
	Kitchener, Canada	2019-02-01
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	Cambridge, Canada	2019-02-02
	Brampton, Canada	2019-02-02
	Toronto, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Scarborough, Canada	2019-02-02
	Waterloo, Canada	2019-02-02

Name	Location	Date
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	Waterloo, Canada	2019-02-02
	Toronto, Canada	2019-02-02
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	Toronto, Canada	2019-02-02
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Name	Location	Date
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Name	Location	Date
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	Waterloo, Canada	2019-02-02
	Guelph, Canada	2019-02-02
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Name	Location	Date
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	Waterloo, Canada	2019-02-02
	Beirut, Lebanon	2019-02-02
	New Dundee, Canada	2019-02-02
	Flamborough, Canada	2019-02-02
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Name	Location	Date
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	Waterloo, Canada	2019-02-02
	Hilton Beach, Canada	2019-02-02
	Waterloo, Canada	2019-02-02

Name	Location	Date
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Name	Location	Date
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	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Brampton, Canada	2019-02-02
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	Cambridge, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Toronto, Canada	2019-02-02
	Brampton, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Okotoks, Canada	2019-02-02
	Brampton, Canada	2019-02-02
	Tweed, Canada	2019-02-02
	Scarborough, Canada	2019-02-02
	Kitchener, Canada	2019-02-02

Name	Location	Date
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Ontario, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	La Habana, Cuba	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	North Yorp, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Tillsonburg, Canada	2019-02-02
	Kitchener Ontario, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Cambridge, Canada	2019-02-02

Name	Location	Date
	Guelph, Canada	2019-02-02
	Guelph, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kingston, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Okotoks, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02

Name	Location	Date
	Brampton, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	San Diego, California, US	2019-02-02
	Cambridge, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Woodbridge, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Toronto, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Toronto, Canada	2019-02-02
	Waterloo, Canada	2019-02-02

Name	Location	Date
	Waterloo, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	San Francisco, California, US	2019-02-02
	Burlington, Canada	2019-02-02
	Toront, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Crediton, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	San Antonio, Texas, US	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Cambridge, Canada	2019-02-02

Name	Location	Date
	Kitchener, Canada	2019-02-02
	Brampton, Canada	2019-02-02
	Brampton, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Lancaster, New York, US	2019-02-02
	Kitchener, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02

Name	Location	Date
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
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	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Toronto, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Wellesley, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02

Name	Location	Date
	Cambridge, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Peterborough, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
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	Cambridge, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Baden, Canada	2019-02-02
	Elmira, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02

Name	Location	Date
	Waterloo, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	North York, Canada	2019-02-02
	Waterloo Region, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Whitehall, Pennsylvania, US	2019-02-02
	Waterloo, Canada	2019-02-02
	Gîza, Egypt	2019-02-02
	Toronto, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	New Hamburg, Canada	2019-02-02
	Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02

Name	Location	Date
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Regina, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Milton, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Breslau, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
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	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kingston, Canada	2019-02-02
	Kitchener, Canada	2019-02-02

Name	Location	Date
	Waterloo, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Modrica, Bosnia	2019-02-02
	Kitchener, Canada	2019-02-02
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	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Toronto, Canada	2019-02-02
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	Kitchener, Canada	2019-02-02
	Toronto, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	New Hamburg, Canada	2019-02-02
	Brantford, Canada	2019-02-02

Name	Location	Date
	Kitchener, Canada	2019-02-02
	kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Quispamsis, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	kitchener, Canada	2019-02-02
	kitchener, Canada	2019-02-02
	Toronto, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kingston, Jamaica	2019-02-02

Name	Location	Date
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	kitchener, Canada	2019-02-02
	wilmot, Canada	2019-02-02
	Sudbury, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	kitchener, Canada	2019-02-02
	Fonthill, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	New Hamburg, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kingston, Jamaica	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Waterloo, Canada	2019-02-02

Name	Location	Date
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Toronto, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	New Hamburg, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Redmond, Washington, US	2019-02-02
	Waterloo, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Baden, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Waterloo, Canada	2019-02-02

Name	Location	Date
	Waterloo, Canada	2019-02-02
	London, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Wellesley, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Scarborough, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Elmira, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Port Perry, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Elmira, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02

Name	Location	Date
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Westmount, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	New hamburg, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Toronto, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Elmira, Canada	2019-02-02
	Waterloo, Canada	2019-02-02

Name	Location	Date
	Toronto, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Plattsville, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Toronto, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02

Name	Location	Date
	Hamilton, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Toronto, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Lancut, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02

Name	Location	Date
	Kitchener, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Hamilton, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Cambridge, Canada	2019-02-02

Name	Location	Date
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
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	Waterloo, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Toronto, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Toronto, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Toronto, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Brockville, Canada	2019-02-02

Name	Location	Date
	Waterloo, Canada	2019-02-02
	Toronto, Canada	2019-02-02
	Toronto, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Mississauga, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Westmount, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Port Elgin, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
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	Kitchener, Canada	2019-02-02
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	Kitchener, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Kitchener, Canada	2019-02-02

Name	Location	Date
	Sarnia, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Cambridge, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	London, Canada	2019-02-02
	Elmira, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Linwood, Canada	2019-02-02
	Toronto, Canada	2019-02-02
	Toronto, Canada	2019-02-02
	Maryhill, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Elmira, Canada	2019-02-02
	Kitchener, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	New Hamburg, Canada	2019-02-02
	1R9, Canada	2019-02-02
	Waterloo, Canada	2019-02-02
	Brampton, Canada	2019-02-02
	Cambridge, Canada	2019-02-03

Name	Location	Date
	Mississauga, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	waterloo, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Cambridge, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Toronto, Canada	2019-02-03
	Toronto, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Maryhill, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Waterloo, Canada	2019-02-03

Name	Location	Date
	Waterloo, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	St. Jacobs, Canada	2019-02-03
	Heidelberg, Canada	2019-02-03
	Hoshiarpur, India	2019-02-03
	Waterloo, Canada	2019-02-03
	Toronto, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Elmira, Canada	2019-02-03
	Elmira, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Markham, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
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	Kitchener, Canada	2019-02-03
	Kitchener, Canada	2019-02-03

Name	Location	Date
	Kitchener, Canada	2019-02-03
	Elmira, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Wasaga Beach, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Conestogo, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	kitchener, Canada	2019-02-03
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	Kitchener, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Aurora, Canada	2019-02-03
	Elmira, Canada	2019-02-03
	Woodstock, Canada	2019-02-03

Name	Location	Date
	Waterloo, Canada	2019-02-03
	Cambridge, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Guelph, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Cambridge, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
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	Cambridge, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
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	Cambridge, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Cambridge, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Abbotsford, Canada	2019-02-03
	Kitchener, Canada	2019-02-03

Name	Location	Date
	Petersburg, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Etobicoke, Canada	2019-02-03
	kitchener, Canada	2019-02-03
	Newmarket, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Listowel, Canada	2019-02-03
	Waterdown, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Brampton, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Toronto, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Cambridge, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Kitchener, Canada	2019-02-03

Name	Location	Date
	Kitchener, Canada	2019-02-03
	Saskatoon, Canada	2019-02-03
	North York, Canada	2019-02-03
	Ajax, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	North York, Canada	2019-02-03
	Elmira, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Toronto, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Ontario, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Waterloo, Canada	2019-02-03
	Waterloo, Canada	2019-02-03

Name	Location	Date
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	Barrie, Canada	2019-02-03
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	London, Canada	2019-02-03
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	Waterloo, Canada	2019-02-03
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	Waterloo, Canada	2019-02-03
	Cambridge, Canada	2019-02-03
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	Toronto, Canada	2019-02-03
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Name	Location	Date
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	Elmira, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
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	Waterloo, Canada	2019-02-03
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	Kitchener, Canada	2019-02-03

Name	Location	Date
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	Kitchener, Canada	2019-02-03
	New Hamburg, Canada	2019-02-03

Name	Location	Date
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	Waterloo, Canada	2019-02-03
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	Cambridge, Canada	2019-02-03
	Wellesley, Canada	2019-02-03
	Kitchener, Canada	2019-02-03

Name	Location	Date
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	Elmira, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
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	Cambridge, Canada	2019-02-03
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	Kitchener, Canada	2019-02-03
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	Waterloo, Canada	2019-02-03

Name	Location	Date
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	Toronto, Canada	2019-02-03

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	Scarborough, Canada	2019-02-03
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	Cambridge, Canada	2019-02-03

Name	Location	Date
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	Breslau, Canada	2019-02-03
	Waterloo, Canada	2019-02-03

Name	Location	Date
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	Kitchener, Canada	2019-02-03
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	Kitchener, Canada	2019-02-03
	New Hamburg, Canada	2019-02-03
	Kitchener, Canada	2019-02-03
	Cambridge, Canada	2019-02-03

Name	Location	Date
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	San Antonio, Texas, US	2019-02-03
	Scarborough, Canada	2019-02-03
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	Kitchener, Canada	2019-02-03

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	Kitchener, Canada	2019-02-03

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	Kitchener, Canada	2019-02-04
	Waterloo, Canada	2019-02-04
	Providenciales, Turks & Caicos Islands	2019-02-04

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	Scarborough, Canada	2019-02-04
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	Kitchener, Canada	2019-02-04
	Kitchener, Canada	2019-02-04
	Kitchener, Canada	2019-02-04
	North York, Canada	2019-02-04

Name	Location	Date
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	Wainfleet, Canada	2019-02-04
	Kitchener, Canada	2019-02-04
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	Toronto, Canada	2019-02-04
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	Kitchener, Canada	2019-02-04
	Brampton, Canada	2019-02-04

Name	Location	Date
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	Toronto, Canada	2019-02-04
	Cambridge, Canada	2019-02-04
	Cambridge ON, Canada	2019-02-04
	Kitchener, Canada	2019-02-04
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	Kitchener, Canada	2019-02-05
	Kitchener, Canada	2019-02-05
	Waterloo, Canada	2019-02-05
	Kitchener, Canada	2019-02-05
	Kitchener, Canada	2019-02-05
	Cambridge, Canada	2019-02-05



Appendix D

Smart Waterloo Region. Contribution Letters

[REDACTED] Letter of Support

[REDACTED] Letter of Support

[REDACTED] Letter of Support

[REDACTED] Letter of Support

[REDACTED] Letter of Support

[REDACTED] Letter of Support

[REDACTED] Letter of Support

[REDACTED] Letter of Support

[REDACTED] Letter of Support

[REDACTED] Letter of Support

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[REDACTED] Letter of Support1

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[REDACTED] Letter of Support

[REDACTED] Letter of Support

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[REDACTED] Letter of Support

[REDACTED] Letter of Support

[REDACTED] Letter of Support

[REDACTED] Letter of Support

[REDACTED] Letter of Support





Toronto, le 8 février 2019


Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Objet : Lettre d'appui au projet « Waterloo Region's Smart Cities Challenge »

Chers membres du jury,

 appuie officiellement la demande de financement que vous souhaitez déposer auprès de Impact Canada's Smart Cities Challenge pour la région de Waterloo.



 reconnaît que le Défi des villes intelligentes est une façon novatrice pour le gouvernement du Canada d'aider les collectivités à devenir plus saines, inclusives et agréables à vivre. Ce sont des valeurs que nous partageons pour nos écoles : se sentir en sécurité pour nos élèves et tous les membres qui se déplacent dans nos collectivités, vivre dans un environnement sain par la mise en œuvre de mesures préventives, s'émanciper et être inclus dans la société quelles que soient les difficultés que nos membres peuvent rencontrer.

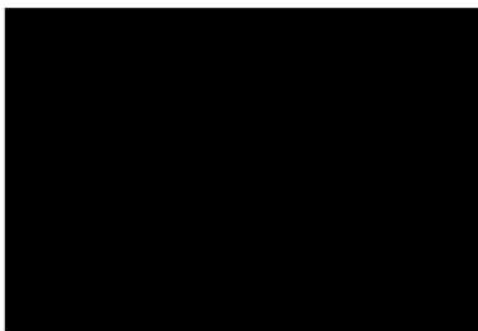
Nous agréons qu'il est primordial d'aider les élèves à développer les habiletés nécessaires pour atteindre ces objectifs, le Défi représente un outil supplémentaire en dehors des murs de l'école.


Les modalités de cette collaboration seront déterminées une fois que le financement aura été confirmé.

Il nous fera plaisir de répondre à toutes questions éventuelles, relatives à cette lettre.

Chers membres du jury, nous espérons que la Région de Waterloo remportera le Défi des villes intelligentes dans la catégorie du 1^e prix d'une valeur de 50 millions de dollars! Une opportunité inédite pour faire la différence auprès de nos jeunes dans la région.

Je vous prie de bien vouloir accepter, Mesdames, Messieurs, mes salutations les plus cordiales.








February 14, 2019



Smart Cities Challenge Jury
% Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa Ontario
Canada K1A 0A3

Dear Smart Cities Challenge Jury,


 enthusiastically supports the Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*.

 Each year, we support several programs in Kitchener, Waterloo, Cambridge and the surrounding rural municipalities that make up Waterloo Region. 


We believe the Waterloo Region Smart Cities Challenge initiative will greatly enhance the wellbeing of youth across Waterloo Region in a new way that fosters collaboration, youth empowerment and a coordinated approach to service delivery.

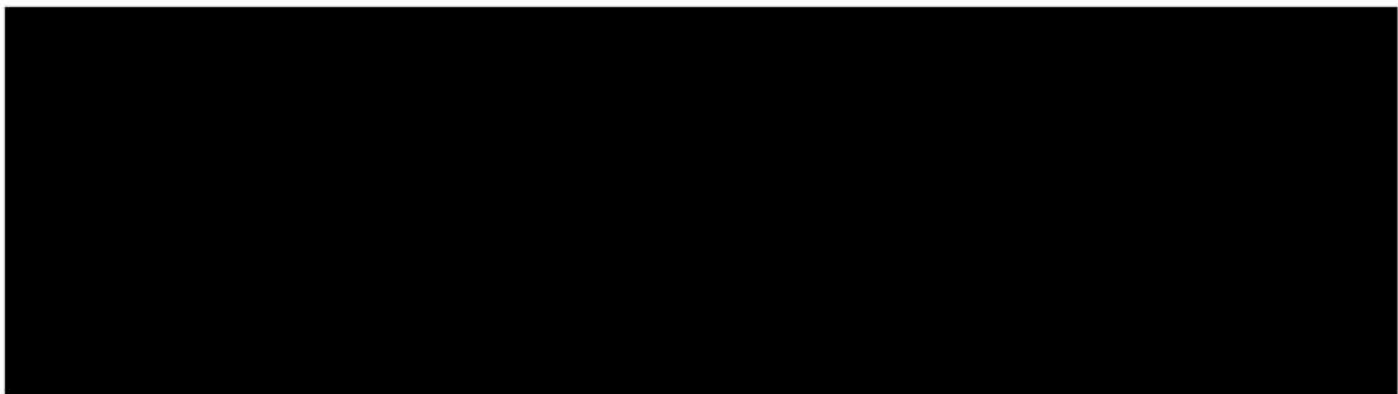
 is committed to providing the Waterloo Region Smart Cities Challenge initiative with our support in forging networks within the Region, cooperating with partners in collecting data and implementing innovative technology solutions, and participating in opportunities designed to increase the well-being of children and youth. 

We look forward to any opportunity to support the implementation of programming as initiatives unfold.

 fervently hopes Waterloo Region will be selected as the winning city in the Smart Cities Challenge \$50M prize category. We are confident that Waterloo Region will prove the wisdom of that selection.

Sincerely,





February 11, 2019

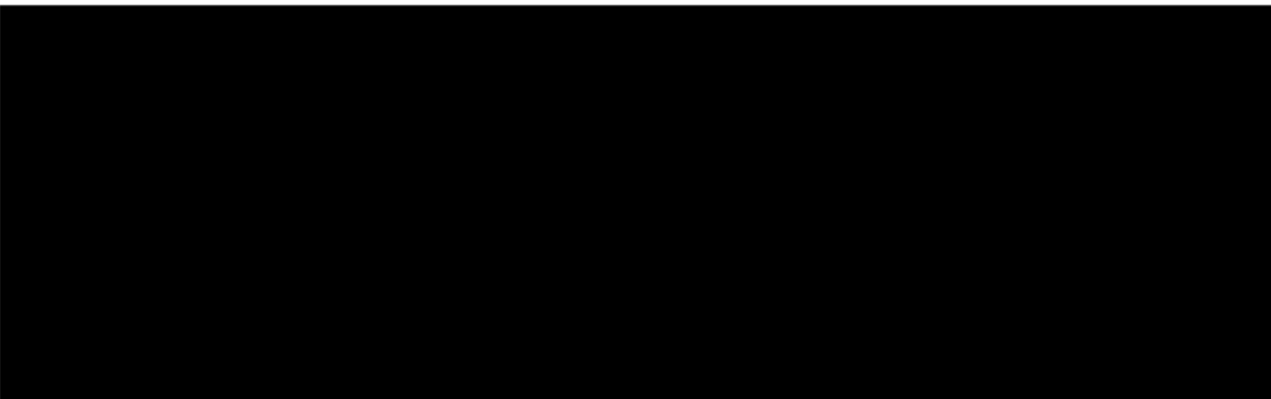
Smart Cities Challenge Jury

c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

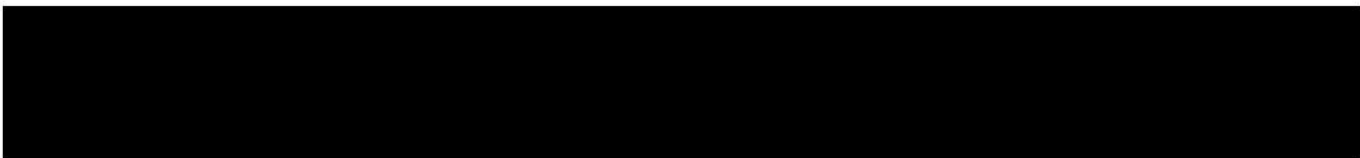
Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury,

I am writing to express my full support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*.



We believe the Waterloo Region Smart Cities Challenge initiative will help us access new opportunities and make a big difference in the lives of [REDACTED] children and youth in Waterloo Region. Partnerships are fundamental to make significant shifts for our [REDACTED] people and we are thrilled to partner with Waterloo Region Smart Cities team. As Waterloo Region is a hub for technology and innovation, we believe the technology-enabled programs and services that will be implemented during this project will help us to create meaningful, relevant programming to aid [REDACTED] youth in the development of meaningful life skills that will serve them through the 21st century. By enabling organizations like ours to work



with technology partners, Waterloo Region's Smart Cities Challenge initiative will help us create relevant, meaningful experiences for youth that support [REDACTED] children and youth with life skills and other wellbeing supports.

[REDACTED] is committed to providing the Waterloo Region Smart Cities Challenge initiative with our support by providing [REDACTED] children and youth with a Connected Community Space that will be used for developmental and support opportunities. Funding from the Smart Cities Challenge will assist us work with community partners to develop and offer customized STEAM training, social service and mental health supports and other [REDACTED] wellness related supports.

[REDACTED]

Smart Cities Challenge Jury, I truly hope you will select Waterloo Region as the winning city in the Smart Cities Challenge \$50M prize category. With your support, we look forward to making a difference in the lives of our young [REDACTED] people.

Sincerely,

[REDACTED]

February 25, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario K1A 0A3

Members of the Smart Cities Challenge Jury:

On behalf [REDACTED] of Waterloo Region [REDACTED], I am enthusiastically adding our voice in support of our community's Smart Cities Challenge bid.

[REDACTED] is a community organization committed to helping children and youth live their potential. [REDACTED]

[REDACTED]

[REDACTED] Every day we are fortunate to see and hear first-hand the impact our programs have on the participants and how transforming this impact can be. [REDACTED]

[REDACTED]

We are happy to see that the Phase 2 Smart Waterloo Region consultation around child and youth well-being has further highlighted the importance of meaningful connection of caring adults in the lives of children and youth – and the important role that mentorship can play. We know first hand that many children and youth in Waterloo Region benefit from caring adults in their lives outside of their family who take an interest in them as an individual, and support their path forward to a positive future. Going forward into implementation of the Smart Waterloo Region initiative, we are excited to work together with Smart Waterloo Region and other community partners, to encourage corporate support of mentoring for children and youth in Waterloo Region, including the development of a pilot E-mentoring platform. We believe this project will expand the number of caring adults connecting in meaningful ways to children and youth in our community. Furthermore, the introduction of E-mentoring options will help overcome distance, isolation, transportation and disability challenges for mentors and youth.

We are looking forward to working together with all partners through implementation of this project, and would like to offer in-kind support of way of staff time and dedication to this project. That means,

[REDACTED]

[REDACTED]

[REDACTED]

ATIA - 13(1)(d)

ATIA - 19(1)

by becoming the winning community for the Smart Cities Challenge initiative,

[REDACTED]

Smart Cities Challenge Jury, I hope you will select Waterloo Region as the winning city in the Smart Cities Challenge \$50M prize category. With your support, we look forward to making a greater difference in the lives of all our young people.

With support,

[REDACTED]

[REDACTED]

[REDACTED]

February 1, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury,

On behalf of [REDACTED] I am writing to express my support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's Smart Cities Challenge.

We are supporting the Waterloo Region Smart Cities Challenge for multiple reasons:

- We've worked as a Community Partner of Communitech for over 10 years, and know first-hand the impact of directing Waterloo Region's technology community towards youth skill development, career exploration, and mentorship
- The focus on child and youth well-being, while beneficial in any community, is especially valuable for Waterloo Region, as it will proactively address issues inherent in our rapid growth
- The process has already been extremely effective in bringing together relevant stakeholders

[REDACTED] we believe the Waterloo Region Smart Cities Challenge will help us reach more youth with more impact, so that youth are increasingly able to reach their potential and meet Canada's needs for a highly skilled workforce.

I hope you will select Waterloo Region as the winning city in the Smart Cities \$50M prize category. With your support, we can build a community that will drive more prosperity for all Canadians.

Sincerely,

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury;

I am writing [REDACTED]
[REDACTED] to express support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*.

[REDACTED]

We believe the Waterloo Region Smart Cities Challenge initiative will have a lasting positive impact on the lives of children and youth in Waterloo Region. Specifically, we believe the data-driven programs and scalable learning technologies developed through a connected-community framework will help agencies who are planning services for children and youth know who they are serving; how those clients are accessing services and whether they are achieving – or not achieving – the outcomes for healthy living. [REDACTED] we know that one of the biggest barriers facing agencies trying to deliver positive outcomes through their services is the massive lack of data on how children, youth and their families are doing in their communities. The lack of connected data on how individuals are accessing services makes it difficult for agencies to understand who they are reaching, what other services are being used and whether their work is having any impact on the broader community. Waterloo Region's proposed initiative has the opportunity to create significant impact by ensuring a system of data-driven care that is cohesive, timely, well-informed, and client-centered. Based on our [REDACTED] in this sector, we know this is the impact that children, youth and families want to experience.

[REDACTED]

[REDACTED]

ATIA - 13(1)(d)

ATIA - 19(1)

[REDACTED] is committed to providing the Waterloo Region Smart Cities Challenge initiative with our support in the development of indicators and proxy measures related to child and youth [REDACTED] and well-being; partnership development related to evidence creation through the youth innovation lab; support for engagement of youth, families and other key stakeholders in the child and youth [REDACTED] sector; and, support for capacity-building related to the use and integration of data for child and youth [REDACTED] and well-being. By working together in the ways that have been outlined, [REDACTED]

[REDACTED] We look forward to any opportunity to support the implementation of programming as activities unfold.

[REDACTED]

Smart Cities Challenge Jury, I hope you will select Waterloo Region as the winning city in the Smart Cities Challenge \$50M prize category. With your support, we look forward to helping to build healthier communities for young people.

Sincerely,

February 13, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury,

I am writing, [REDACTED] to express support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*. [REDACTED] we serve the City of Cambridge and the Township of North Dumfries (total population approx. 150,000), [REDACTED] we are proud to support each year many dozens of organizations that serve our geographic area, and to participate in region-wide initiatives such as [REDACTED] Waterloo Region's Smart Cities Challenge.

[REDACTED]

We are confident that the Waterloo Region Smart Cities Challenge initiative will help us access new opportunities and make a huge and lasting difference in the lives of children and youth in Waterloo Region. Specifically, and we are already seeing evidence to support this, we believe the networks, programs, products and data developed and implemented during this project will help us to create meaningful, relevant programming to aid youth in the development of meaningful life skills. By enabling organizations like ours to work with tech firms and youth, Waterloo Region's Smart Cities Challenge initiative will help us create relevant, meaningful experiences that address a known root cause in areas that children and youth are lacking life skills, and that they have indicated they are worried about. Through this initiative, we expect to forge new partnerships, reach hundreds more youth a year and increase the life skill capacity of local youth.

[REDACTED] estimates that already more than 50% of the funds available each year are directed to making a difference in the lives of children and youth. We are committed to providing Waterloo Region Smart Cities Challenge initiative our support in forging networks within the Region, collaborating with partners in collecting data and implementing innovative technology solutions, and we look forward to all opportunities to support the implementation of programming as initiatives unfold.

While we are [REDACTED] in our region, we are always very pleased to have the opportunity to work together, and the Waterloo Region Smart Cities Challenge Initiative resonates with us all. While the level of support available through [REDACTED] has not yet been quantified, we are committed to identifying and securing new funds and will be very pleased to provide in-kind support.

Waterloo Region, with its tech community and its spirit of entrepreneurship and innovation in all areas, is well-positioned for this work, and with your support, we look forward to making a difference in the lives of our young people.

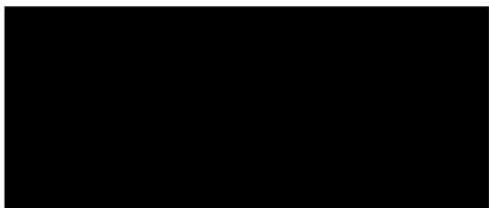
Sincerely,

ATIA - 19(1)



ATIA - 13(1)(d)

ATIA - 19(1)



Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

February 13, 2019

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Members of the Jury:

I am writing to express [REDACTED] support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*.

[REDACTED]

We believe the Waterloo Region Smart Cities Challenge initiative will help Waterloo Region access new opportunities and make a difference in the lives of children and youth in our community. Specifically, we believe the networks, technology-enabled programs and products developed and implemented during this project will help us to create meaningful, relevant programming to aid children and youth in the development of meaningful life skills. By enabling Waterloo Region's technology companies to work closely with child and youth service providers, we will build new partnerships that will ensure our children and youth have the best opportunities ahead of them. We are also confident these new partnerships will generate scalable solutions that can be offered to help other communities across Canada.

[REDACTED] will support the Smart Waterloo Region project in several ways. We will:

- Provide guidance on establishing the new Waterloo Region Child and Youth Data Collaborative
- Build Data Capacity within Waterloo Region's Child and Youth Service Sector
- Work with community partners to create easier access for youth interested in accessing Waterloo Region's start-up economy
- Work with community partners to help develop criteria for technology-enable solutions that will be used to select technology vendors

- ██████████ will provide ██████████ per year over five years for the Waterloo Region Smart Cities Challenge initiative, for a total contribution of ██████████. This investment will substantially be in the form of staff time; facilities access; program design and delivery; advisory services; and promotional support. This funding will be delivered through a mix of cash and in-kind investment.

Our work with [REDACTED] gives us a unique perspective of the leading challenge to firm growth: access to an abundance of skilled talent. If we can – as a community – create and maintain a standard of excellence in the well-being and achievement for our children, our sector will have access to home-grown employees for decades to come. That’s important for our future as a community.

Members of the Jury, I hope you will select Waterloo Region as the winning city in the Smart Cities Challenge \$50M prize category. With your support, we look forward to making a difference in the lives of our young people, and the lives of youth across Canada.

Sincerely,

[REDACTED]

ATIA - 13(1)(d)

ATIA - 19(1)

[REDACTED]

13 February 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury,

[REDACTED] I am very
pleased to provide this letter of support Waterloo Region's Smart Cities Challenge proposal
for funding through Impact Canada's *Smart Cities Challenge*.

[REDACTED]

[REDACTED]

As a partner in the Waterloo Region Smart Cities Challenge initiative, [REDACTED] would look
forward to developing and implementing innovative technology solutions that will support
healthy child development and enhance early years learning for children and families across
our community and beyond.

Sincerely,

[REDACTED]

[REDACTED]

ATIA - 13(1)(d)

ATIA - 19(1)

February 8th, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, ON K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury,

[REDACTED] recently had an opportunity to learn more about Waterloo Region's Smart Cities Challenge proposal and the incredible impact it could have on children and youth. We are pleased to write this letter in support of this proposal.

[REDACTED]

For the past [REDACTED] years, we have seen the incredible and long-lasting impact our donations have made to individuals, their families and the community. There is a strong alignment between our [REDACTED] mission and what can be achieved exponentially if the Waterloo Region's Smart Cities Challenge proposal is successful.

[REDACTED] is committed to providing the Waterloo Region Smart Cities Challenge initiative with our support in discussing opportunities designed to increase the well-being of children and youth. We will continue to seek out donation opportunities in the region that benefit this demographic, specifically around early childhood development, literacy, mental health and sense of belonging; all key areas of focus in the proposal. In 2019, we will continue to support our multi-year donation agreements

[REDACTED]

We are hopeful that the Smart Cities Challenge Jury will select Waterloo Region in the Smart Cities Challenge \$50M prize category. With one shared goal, incredible positive change can happen.

Yours respectfully,

[REDACTED]

[REDACTED]

February 5, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury

[REDACTED] is writing to express our support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*.

[REDACTED]

We believe the Waterloo Region Smart Cities Challenge initiative will help us access new opportunities and make a huge difference in the lives of children and youth in Waterloo Region. Specifically, we believe the networks, programs, products and data developed and implemented during this project will help us to create meaningful, relevant programming to aid youth in the development of meaningful life skills. By enabling organizations like ours to work with tech firms and youth, Waterloo Region's Smart Cities Challenge initiative will help us create relevant, meaningful experiences for youth that address a known root cause issue that children and youth are lacking life skills and they are worried about it. Through this initiative, we expect to forge new partnerships, and increase the life skill capacity of local youth.

As we identify specific solutions [REDACTED]
[REDACTED] we will work towards adapting these solutions [REDACTED]
[REDACTED] by creating customised application of these ideas [REDACTED]

[REDACTED]

[REDACTED] recently had the opportunity to sit down and speak with representatives from the Waterloo Region Smart Cities Advisory Team. We are excited about the potential we have – as a community – to make a difference. To leverage our strengths to create long-term, meaningful impact for all children and youth within our Region.

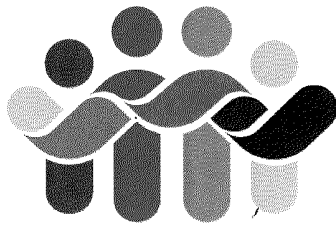
Smart Cities Challenge Jury, I hope you will select Waterloo Region as the winning city in the Smart Cities Challenge \$50M prize category. With your support, we look forward to making a difference in the lives of our young people.

Sincerely,

[REDACTED]

[REDACTED]

[REDACTED]



Children and Youth Planning Table of Waterloo Region

February 20, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

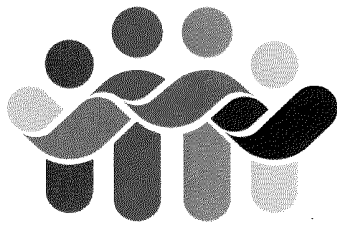
Dear Smart Cities Challenge Jury:

We are writing to express our support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*.

As Co-Chairs of the Children and Youth Planning Table of Waterloo Region (CYPT), we know first-hand the importance of making child and youth wellbeing a priority for any community, and that no one organization can solve the persistent child and youth wellbeing challenges that we face. As an open-door collaborative, the CYPT has brought together over 500 professionals (e.g., service providers, funders, researchers, public servants, educators, health care professionals, etc.) from various corners of our community over the past seven years. Our work together is focused on breaking down silos, removing organizational 'hats' to put children and youth at the centre of our efforts, and creating a community culture where children and youth matter – and they know they matter. Our 70+ member organizations (see attached listing) have come together voluntarily to cross sectors, mandates, ministries and geographies with the vision of 'happy healthy children and youth – today and tomorrow'. We are eager to expand and leverage this valuable social infrastructure toward even more ambitious community goals.

Happy, healthy children and youth – today and tomorrow.

www.childrenandyouthplanningtable.ca
99 Regina St. S., 5th Floor, Waterloo, Ontario, N2J 4G6
519-883-2375



Children and Youth Planning Table of Waterloo Region

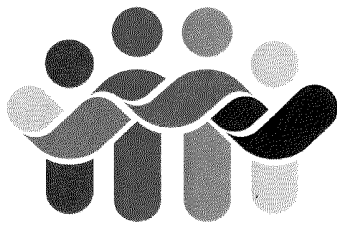
The *Smart Cities Challenge* came at just the right time to accelerate the efforts of the CYPT and build off of the important foundational work towards system-level change. As a Key Partner, we have invested significant backbone staff time to both the Phase 1 and Phase 2 Smart Cities Challenge work. The membership has provided critical advice and deep expertise from the perspective of those who work with children, youth and families every day. They have also been an irreplaceable conduit to the children, youth and families who participated in the extensive Smart Cities Challenge engagement – particularly in their ability to leverage their trusting relationships with those furthest from opportunity. The time and focus of our Data, Research & Evaluation Team, as well as our Communications Advisory Team have also been heavily utilized to ensure the success of the Waterloo Region Smart Cities Challenge. More than anything however, the CYPT has promoted and reinforced the importance of meaningful child and youth engagement and of focusing on root causes in the creation of the Smart Cities Challenge submission.

As we look forward to implementation of the Waterloo Region Smart Cities Challenge proposal, the CYPT remains fully engaged in the project. We are committed to fully aligning our collective efforts to support the successful implementation of the Waterloo Region Smart Cities Challenge proposal. We will dedicate time and effort to ensure a hand-in-hand approach to the following areas of work in particular:

- **Collective Impact** – we are experts in working collectively, and will help to realize the greatest possible impact in the focus areas of early childhood development, emotional/mental health, literacy and sense of belonging. The CYPT will be able to inform the data/tech-enabled supports, and perhaps most notably, inform and complement the work related to non-data/tech-enabled approaches and strategies.
- **Data, Research and Evaluation** – we will support the implementation, usage and capacity building needed for the Smart Waterloo Region Data Collaborative, the development and support of a Shared Measurement Framework, and efforts to understand the various impacts that are being achieved.
- **Meaningful Child and Youth Engagement** – we will champion the notion that the voices and involvement of children and youth remain front and centre to the implementation of this work, and ensure that a diverse mix of children and youth have opportunities not only for input, but also to co-design and co-create with adult allies, as well as to lead.

Happy, healthy children and youth – today and tomorrow.

www.childrenandyouthplanningtable.ca
99 Regina St. S., 5th Floor, Waterloo, Ontario, N2J 4G6
519-883-2375



Children and Youth Planning Table of Waterloo Region

- Strategic Engagement – we will leverage our relationships to ensure greater involvement of less-engaged sectors, and shifting norms to ensure child and youth wellbeing is a shared societal priority.
- Service System Access and Navigation – we will continue our work towards a system of services and supports for children, youth and families that is easier to access, more timely, cohesive and well informed.

We are on the road to becoming the benchmark community in Canada for child and youth wellbeing, and the Children and Youth Planning Table is eager to ensure our on-going, collective success. We know that to go far, we need to go together, and the membership of the Children and Youth Planning Table is fully committed to contributing meaningfully to this journey!

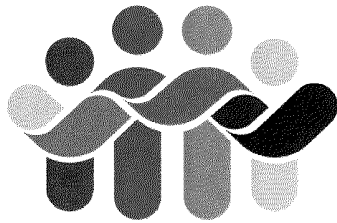
Sincerely,

Deb Engel, Director of Community Services, Carizon
Children and Youth Planning Table Co-Chair

Barb Cardow, Director of Children's Services, Region of Waterloo
Children and Youth Planning Table Co-Chair

Happy, healthy children and youth – today and tomorrow.

www.childrenandyouthplanningtable.ca
99 Regina St. S., 5th Floor, Waterloo, Ontario, N2J 4G6
519-883-2375



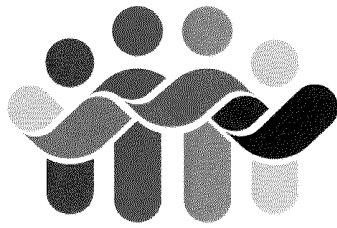
Children and Youth Planning Table of Waterloo Region

Member Organizations:

1. Adventures 4 Change
2. ASD Collaborative
3. Big Brothers Big Sisters Waterloo Region
4. Cambridge Family Early Years Centre
5. Cambridge Foodbank
6. Carizon Family and Community Services
7. Centre Educatif Village D'Elisabeth
8. Child Witness Centre
9. City of Cambridge
10. City of Kitchener—Children and Youth Services
11. CMHA Waterloo Wellington Dufferin
12. Community Justice Initiatives of Waterloo Region
13. Conestoga College
14. Conseil Scolaire Catholique MonAvenir
15. Conseil Scolaire Viamonde
16. Creative Beginnings Childcare Centre
17. Crime Prevention Council of Waterloo Region
18. Developmental Services Resource Centre Waterloo Region
19. Early Literacy Alliance of Waterloo Region
20. Early-ON YMCA
21. Emmanuel Childcare
22. Extend-a-Family Waterloo Region
23. Family and Children's Services of the Waterloo Region
24. Family Counselling Centre of Cambridge and North Dumfries
25. Food 4 Kids Waterloo Wellington
26. Highland Stirling Community Group
27. House of Friendship
28. Idea Exchange
29. Inspiring Minds Early Learning and Child Care Centre
30. Jacob Hespeler Child Care Centre
31. John Howard Society of Waterloo-Wellington
32. KidsAbility
33. Kinbridge Community Association
34. Kitchener Public Library
35. Kitchener Waterloo Community Foundation
36. Kitchener Waterloo Multicultural Centre
37. KW Counselling Services

Happy, healthy children and youth – today and tomorrow.

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99 Regina St. S., 5th Floor, Waterloo, Ontario, N2J 4G6
519-883-2375




Children and Youth Planning Table of Waterloo Region

38. KW Habilitation
39. Langs Farm Village Association
40. Lutherwood
41. Lyle S. Hallman Foundation
42. Mac Maple Grove School Preschool and Child Care Centre
43. Our Place Family Resource and Early Years Centre
44. Owl Child Care Services of Ontario
45. Peekaboo Child Care Centre
46. Plasticity Labs
47. Project Read Literacy Network
48. Region of Waterloo—Community Services
49. Region of Waterloo—Library Services
50. Region of Waterloo—Public Health and Emergency Services
51. Shore Centre
52. Social Planning Council of Cambridge and North Dumfries
53. St. John's Nursery School
54. Strong Start
55. The Oaks Child Care
56. The Salvation Army Parent Child Resource Centre
57. United Way Waterloo Region Communities
58. Waterloo Catholic District School Board
59. Waterloo Infant Toddler Daycare Association
60. Waterloo Public Library
61. Waterloo Region District School Board
62. Waterloo Region Family Network
63. Waterloo Region Police Service
64. Waterloo Wellington Local Health Integration Network
65. White Own Native Ancestry
66. Wilfrid Laurier University
67. Wilmot Family Resource Centre
68. Woolwich Community Health Centre
69. Woolwich Community Services
70. YMCAs of Cambridge & Kitchener-Waterloo
71. YW Kitchener Waterloo
72. YWCA of Cambridge

Happy, healthy children and youth – today and tomorrow.


www.childrenandyouthplanningtable.ca
99 Regina St. S., 5th Floor, Waterloo, Ontario, N2J 4G6
519-883-2375




February 19, 2019





Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Members of the *Smart Cities Challenge* Jury:

On behalf of  of Waterloo Region, I am enthusiastically adding our voice in support of our community's *Smart Cities Challenge* bid.


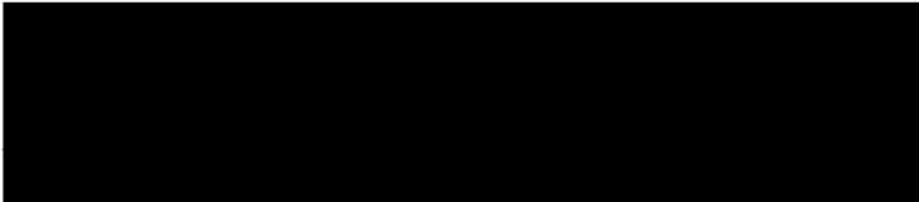


We are happy to see that the Phase 2 Smart Waterloo Region consultation has helped to highlight the connection between a system of supports that is timely, responsive and well-informed – and child and youth well-being. All families can benefit from better system coordination, and we know first hand that these benefits are magnified for those managing multiple and/or complex needs.

Going forward into implementation of the Smart Waterloo Region initiative, we are excited to partner with Smart Waterloo Region to pilot a Shared Electronic Health Record system. This pilot will help us as a community establish system supports that make it easier for multiple service providers to connect, to consistently track information in meaningful and informative ways, and reduce the stress and burden on families. We are looking forward to working together through implementation of this project, and others that benefit children and youth  and would like to offer in-kind support from our  staff. That means, by becoming the winning community for the *Smart Cities Challenge* initiative, we anticipate leveraging at least  in additional in-kind supports through .

Smart Cities Challenge Jury, I hope you will select Waterloo Region as the winning city in the *Smart Cities Challenge* \$50M prize category. With your support, we look forward to making a greater difference in the lives of all our young people.

With support,



February 15, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario, K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

We are writing to express our collective support for Waterloo Region's Smart Cities Challenge proposal for \$50 million through Impact Canada's *Smart Cities Challenge*.

[REDACTED] The Index has identified key indicators of child and youth well-being and relevant sources of data. The availability and validity of some of this data varies, as there are limitations accessing or using the data in a local context, especially in smaller communities and rural regions.


Together, we are exploring the opportunity to develop community capacity in gathering comprehensive, actionable data on how children and youth are experiencing life. It is our hope that starting in spring 2019, we will collaborate...

- to develop a prototype community survey [REDACTED]
- to test survey implementation approaches co-designed with young people
- to produce a model survey report;
- to support young people's positive engagement in the process of gathering, understanding and using data about their lives; and,
- to share knowledge and learnings within Waterloo Region and to communities across Canada.

Ultimately, this partnership would support Waterloo Region, as well as communities in Ontario and across Canada to [REDACTED] build capacity in gathering data with and about children and youth, identify actions to better meet the needs of young people and invest in what matters most. Waterloo Region will be the first community to measure and monitor the well-being of children and youth [REDACTED] will support this by filling data gaps and ensuring the data accurately reflects life in Waterloo Region for children and youth.

Over the next year we hope to invest more than [REDACTED] in financial and in-kind support into this foundational work.

The Waterloo Region *Smart Cities Challenge* proposal would support subsequent phases of this partnership. Including the implementation of the [REDACTED] Survey in Waterloo Region to gather robust and comprehensive data about child and youth experiences



and perceptions to complement administrative data sources and data from general social surveys. Subsequent phases will also support knowledge translation, sharing the survey tool and lessons learned in relation to survey development and implementation as well as youth engagement. There would be tremendous benefit in leveraging this work as part of the *Smart Cities Challenge* to improve the well-being of children and youth in Waterloo Region and across Canada through this partnership.

Smart Cities Challenge Jury, we hope you will select Waterloo Region as the winning community in the *Smart Cities Challenge* \$50 million prize category. With your support, we look forward to making a difference in the lives of children and youth in Waterloo Region and across Canada.

Sincerely,



[REDACTED]

February 19, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury

I am writing to express my support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*.

[REDACTED]

We believe the Waterloo Region Smart Cities Challenge initiative will help us access new opportunities and make a significant difference in the lives of children in Waterloo Region. By enabling organizations like ours to work with tech firms and children, Waterloo Region's Smart Cities Challenge initiative will help us create relevant, meaningful experiences for children with the goal of reducing the percentage of Kindergarten aged children in our region who are vulnerable to difficulties in learning.

[REDACTED] is committed to providing the Waterloo Region Smart Cities Challenge initiative with our support in forging networks within the Region, cooperating with partners in collecting data and implementing innovative technology solutions, and participating in opportunities designed to increase the well-being of children and youth. [REDACTED]

[REDACTED] We look forward to any opportunity to support the implementation of programming as initiatives unfold.

Smart Cities Challenge Jury, I hope you will select Waterloo Region as the winning city in the Smart Cities Challenge \$50M prize category. With your support, we look forward to making a difference in the lives of our young people.

Sincerely;

[REDACTED]

[REDACTED]

February 19, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury:


We are writing to express our collective support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*.

We believe the Waterloo Region Smart Cities Challenge initiative will help Waterloo Region access new opportunities and make a difference in the lives of children and youth in our community. Specifically, we believe the networks, technology-enabled programs and products developed and implemented during this project will help us to create meaningful, relevant programming to aid children and youth in the development of meaningful life skills. By enabling Waterloo Region's business sector to work closely with child and youth service providers, we will build new partnerships that will ensure our children and youth have the best opportunities ahead of them.

Collectively, we will support the Smart Waterloo Region project with the following contributions:

- Working with community partners to create easier access for youth interested in accessing Waterloo Region's start-up economy;
- Facilitating partnerships with Waterloo Region's companies and child and youth service providers to support mentoring opportunities for youth.

We know how important it is to have access to a skilled talent pool. If we can – as a community – create and maintain a standard of excellence in the well-being and achievement for our children, our sector has access to home-grown employees. And that's important for our future growth. We believe the Waterloo Region Smart Cities Challenge is an opportunity for all of our citizens – particularly our children and youth – to grow, to have exceptional opportunities and to prosper.

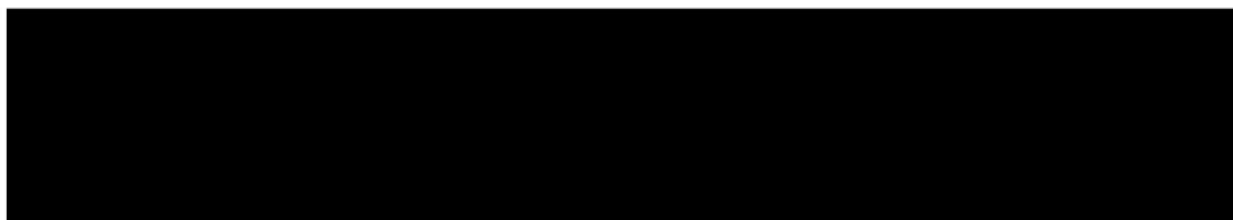
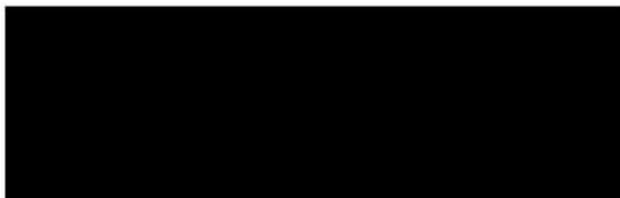


ATIA - 13(1)(d)

ATIA - 19(1)

Smart Cities Challenge Jury, I hope you will select Waterloo Region as the winning city in the Smart Cities Challenge \$50M prize category. With your support, we look forward to making a difference in the lives of our young people.

Sincerely,



[REDACTED]

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

February 18, 2019

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury:

[REDACTED] Waterloo was founded with a bold vision: to develop a unique space in Waterloo Region where children and youth explore, create and connect through STEAM – science, technology, engineering, arts, and math – activities. We believe that through regular, progressive, and inclusive STEAM programming, children in Waterloo Region will be inspired to think critically, explore the world around them and seek out opportunities for exciting and fulfilling lives. That's why we are delighted to partner with the Smart Waterloo Region initiative to help make our community the best community for kids.

At [REDACTED] we are taking a new approach to STEAM activities. Instead of one day or week-long camps or outreach programs, we are taking a page from the minor sports playbook to create long-term, progressive learning models. Our programs are structured in *seasons* of activity that run year-round, with STEAM leagues, volunteer coaches and age-appropriate teams. This successful model has existed in minor sports in Canada for decades and has resulted in generations of children who benefit from teamwork, collaboration, discipline and tolerance. Adapting this model to STEAM programming mirrors those benefits for children in a non-sports environment and builds a progressive, on-going program where children learn, explore and play over time, not just in single instance touchpoints. [REDACTED] programs will be available to all children and will target underrepresented youth including girls, Indigenous Peoples, LGBTQ2, and children in lower-income families so that everyone has the opportunity to be inspired, play and learn through STEAM.

We will offer our programs in a [REDACTED] facility in the heart of Waterloo Region – our arena of STEAM. This [REDACTED] facility will be a place to make, innovate and celebrate. With over [REDACTED] in construction, leasehold improvements and outfitting invested in the space, the [REDACTED] facility will be the ideal home for the Smart Waterloo Region initiative. Through our partnership, [REDACTED] will provide this space in collaboration with Smart Waterloo Region as well as dedicated space rent-free for 20 years with a value of \$5 million to create the Smart Waterloo Region Hub for its Connected Community Spaces program.


Together [REDACTED] and Smart Waterloo Region will support the youngest members of our Region through STEAM programming, the integration of learning technologies, technologies to support mental and physical health, and data-driven programs to ensure our children have the support and guidance they need to be successful. These activities will be the backbone for the creation of Smart Waterloo Region's new Centre of Excellence for Child and Youth Wellbeing [REDACTED]

[REDACTED]

This partnership will bring together private funders, non-profit organizations and government to provide our children and youth with the support, skills and opportunities to be successful in a rapidly changing world. As a pilot program, this partnership and model will be tested, evaluated and adapted so that it can easily be shared with communities across our country. Just as there's a hockey arena in every small town or city, there could be STEAM teams setting up the next generations of children for whatever the future of work may hold.

We are excited about the opportunity to bring the Smart Waterloo Region initiative to life and strongly encourage you to support Canadian young people by awarding Waterloo Region the Smart Cities Challenge.

Sincerely,







February 15, 2019

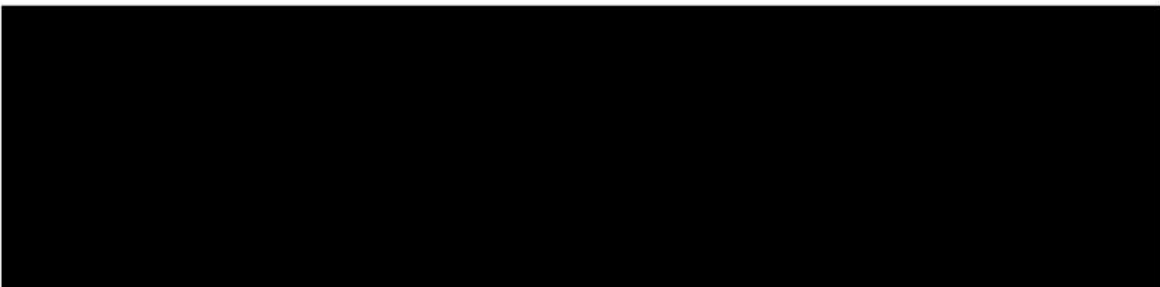
Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, ON K1A 0A3


Dear Smart Cities Challenge Jury,

Re: Support for Waterloo Region's Smart Cities Challenge

, we are writing to express our support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's Smart Cities Challenge.

 serving over 600,000 residents living in the Regional Municipality of Waterloo. Children and youth make up almost 20% of our population, but 100% of our future. For  fostering youth engagement and developing positive relationships with children and youth is essential to community safety and wellbeing. These priorities are reflected in  value of 'People and Partnerships', and our strategic and operational goals.



 is a dedicated partner with many other community service providers working towards developing holistic approaches that will create long-term, meaningful results. The Waterloo Region Smart Cities Challenge initiative will help us tap into new opportunities, aid in the development of new programming aimed at root cause issues, and help make our community more accessible, inclusive and safe.

ATIA - 13(1)(d)

ATIA - 19(1)

We are committed to providing the Waterloo Region Smart Cities Challenge initiative with our support in forging networks within the Region between and among youth, cooperating with partners in implementing innovative engagement solutions, and participating in opportunities designed to increase the wellbeing of children and youth. We look forward to any opportunity to support the implementation of programming as initiatives unfold.

We appreciate your consideration of Waterloo Region as the winning city in the Smart Cities Challenge \$50M prize category. With your support, children and youth in Waterloo Region will continue to lead as a beacon of inspiration and innovation in fostering improved community safety and wellbeing for communities across Canada for generations to come.

Yours truly,



February 12, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury,

I am writing this letter to demonstrate [REDACTED] support for the Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's Smart Cities Challenge.

[REDACTED] achieves this by delivering educational leadership experiences to a diverse range of individuals in the community by providing them with the opportunity to acquire and practice leadership skills. This work is done collaboratively with like-minded organizations in Waterloo Region through the delivery of carefully tailored programs. [REDACTED]

[REDACTED] Through these opportunities, participants learn about their own leadership styles, identify skills they wish to hone and then together, enhance those skills.

[REDACTED] is supporting the Waterloo Region Smart Cities Challenge initiative because our community is finding that now, more than ever our youth are looking for support, direction, and options to look after their own wellbeing. Working with the Waterloo Smart Cities Challenge initiative will enable [REDACTED] to re-imagine what the [REDACTED] could be. It will allow us to provide youth with greater mentorship and learning opportunities which will lead to a greater understanding of the need to engage with their community to make a positive impact.

As we believe in the importance of forging strong networks within our community and harnessing those networks for the greater good, we hope to put our greatest asset, our alumni, to work in support of the Waterloo Region Smart Cities Challenge initiative.

I hope that Waterloo Region is selected for the Smart Cities Challenge \$50M prize category. With your support, we look forward to making a difference in the lives of the youth of our community.

Sincerely,

[REDACTED]

February 13, 2019

Ms. Karen Redman
Regional Chair
Regional Municipality of Waterloo
150 Frederick Street
Kitchener ON N2G 4J3

Dear Ms. Redman,

Thank you for your letter [REDACTED] about Waterloo Region's participation in the Government of Canada Smart Cities Challenge. I applaud your dedication to improving child and youth wellbeing outcomes and am pleased to respond on her behalf.

We are pleased to work in partnership with Waterloo Region on this important initiative. [REDACTED]

[REDACTED]

[REDACTED] will be in touch with Matthew Chandy, the Smart Waterloo Region lead, to explore how best to be of assistance.

Thank you again for writing and for sharing your exciting plans with us. We look forward to being a partner with the Region of Waterloo on this undertaking.

Sincerely,

[Original signed by]

[REDACTED]

[REDACTED]

[REDACTED]

Friday, February 8, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury,

[REDACTED] I am writing
to express my support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact
Canada's *Smart Cities Challenge*.

[REDACTED]

Included in our mission is to promote collaboration,
diversity and inclusion in all communities that we work in.

We believe the Waterloo Region Smart Cities Challenge initiative will help us access new opportunities beyond our "regional borders" and make a huge difference in the lives of children and youth in Ontario. Specifically, we believe the networks, programs, products and data developed and implemented during this project will help us to create meaningful, relevant programming to aid youth in the development of meaningful life skills. By enabling capacity-building within our [REDACTED] Waterloo Region's Smart Cities Challenge initiative will help us enhance and co-create relevant, meaningful experiences for youth that address a known root cause issue that children and youth are lacking life skills and they are worried about it. Through this initiative, we expect to forge new partnerships, and increase the life skill capacity of youth local to Waterloo and Niagara regions.

[REDACTED] are committed to providing the Waterloo Region Smart Cities Challenge initiative with ongoing support in forging networks outside of the Region, cooperating with partners in collecting data and implementing innovative technology solutions and participating in opportunities designed to increase well-being and inclusivity of children and youth. We look forward to any opportunity to support the implementation of new programming as initiatives unfold as well as forging bi-directional programming opportunities, leveraging our existing programs.

Specifically, we look forward to bi-directional opportunities in the areas of capacity building, research and programming in the following areas:

- bi-directional information sharing/best practice development including ongoing consultation
- offering simultaneous programming between regions (including support to plan, coordinate and execute virtually and physically)
- utilizing both regional sites as test beds
- research projects and opportunities
- physical space considerations
- software support
- Other partnerships, projects and opportunities that may arise through this initiative

By working together in the ways that have been outlined, we will be leveraging an additional value of approximately [REDACTED] in in-kind supports.

[REDACTED]

Smart Cities Challenge Jury, I hope you will select Waterloo Region as the winning city in the Smart Cities Challenge \$50M prize category. This initiative would make a positive impact in the lives of children and youth and I am delighted to support the implementation of this initiative upon a successful bid. With your support, we look forward to collaborating with Waterloo Region to make a difference in the lives of young people across Ontario.

Sincerely,

[REDACTED]

[REDACTED]

[REDACTED]

February 25, 2019

Mark Romoff
Chair of the Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Mr. Romoff:

We are writing to express our joint support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*.

The [REDACTED] will invest in community priorities regarding children and youth well-being in alignment with the work happening region-wide to become the benchmark community in Canada for children and youth well-being, as part of the application to Infrastructure Canada for the Smart Cities Challenge.

As key partners, we are supporting the Waterloo Region Smart Cities Challenge because the state of Canada's children is not what we should expect in one of the world's most prosperous countries. Canada ranks 25th of 41 rich countries in overall child and youth well-being when measured against 21 indicators of health, violence, material security and other Sustainable Development Goal targets. We can move this needle, and Waterloo Region is taking leadership to demonstrate how at the community level, smart solutions for and with young people can play a key role advancing the well-being of children and youth and the social, economic and environmental situation of the whole community. We believe this bold goal will inspire other cities to tackle challenging social issues, demonstrate that progress is possible, and show that smart solutions are friendly for young people. We believe tools and solutions we develop locally in Waterloo Region will provide learnings and templates to assist interested communities nationwide. We are confident that the focus on children and youth will bring social and economic benefits that address some entrenched community challenges: inclusion, equity, learning, health and employment.

The goal of the [REDACTED] is to endow generations of children and youth in the Waterloo Region, and support smart solutions for and with young people to improve their well-being. Both individuals and businesses will be provided with the opportunity to support children and youth in their own community by investing in this fund and leveraging the investment that a successful application to Infrastructure Canada for the Smart Cities Challenge would bring to the region. It will provide a philanthropic opportunity for the community to engage in the Smart Cities Challenge that will benefit children and youth for generations to come.

Through an initial donation [REDACTED] will bring awareness to the importance of child and youth well-being in the Region. Having a local business step forward to provide this opportunity to develop a partnership in the community is important. Their alignment with [REDACTED] objectives and the Smart Cities Challenge opportunity is a call to action to other businesses and organizations.

[REDACTED] has also matched [REDACTED] donation by providing an additional [REDACTED] to further support this innovative initiative. In addition to providing funding, [REDACTED] has the experience and community connections to engage people from across the region in moving this initiative forward.

[REDACTED] has a large network of socially engaged Canadians: we will communicate exciting progress to inspire bold goals and projects for children in communities and cities across the country. [REDACTED] has a network [REDACTED] in which to engage and share learnings from this innovative partnership including new smart approaches as a result of community investments to boldly advance the well-being of children and youth.

It is an exciting time in Waterloo Region. One filled with possibilities and promise. Waterloo Region's Smart Cities Challenge proposal outlines opportunities that will make a difference locally – and nationally.

Sincerely,

[REDACTED]

[REDACTED]

February 8, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury:

Waterloo Region's Smart Cities Challenge proposal "Healthy Children and Youth" is an innovative, community-driven project that has my full support.

Based in Waterloo Region, [redacted] is a not-for-profit organization dedicated to supporting STEAM skills development for youth across Canada and beyond.

The "Healthy Children and Youth" initiative will create new opportunities, leverage existing expertise, and forge new community partnerships to make a significant difference in the lives of children and youth, including Indigenous and first-generation immigrant youth. [redacted] will commit our experience and expertise in innovative STEAM programming to create a deeply reflective learning experience. Students will explore a societal issue through STEAM and local Indigenous ways of knowing followed by public engagement to share their learning and broaden impact through the larger community.

[redacted] is also committed to leveraging the Smart Cities Challenge activity by scaling the program in communities across Canada. The initiative is intentionally opened-ended, scalable, and shareable, and can be tailored to individual Indigenous community needs from coast to coast to coast.

On a side note, a campaign for a Smart Cities Challenge could not succeed without an inventive, dedicated – and yes, smart – team. [redacted]

[redacted] With your support for Waterloo Region's "Healthy Children and Youth" initiative, we're ready to get started.


Sincerely,

[redacted]

[redacted]

[redacted]

[redacted]



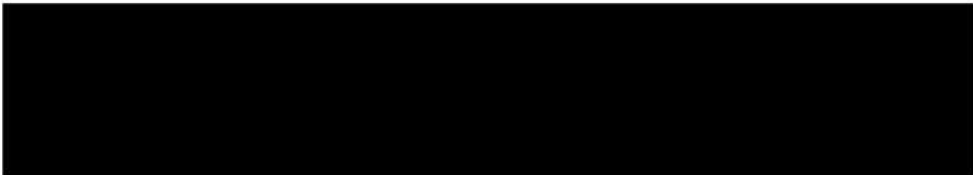
Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

February 15, 2019

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury,

I am writing to express my support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*.





I believe the Waterloo Region Smart Cities Challenge [redacted] STEAM initiative will help [redacted] to integrate science, technology, engineering, art and mathematics, while thinking deeply about a social justice issues from their [redacted] perspective. The initiative will provide the students with an opportunity to express their new skills and knowledge through art, solidifying their learning framed in their [redacted] perspective. This initiative will also provide an opportunity to engage the [redacted] larger community, as their work is shared during an exhibition.

[redacted] I know how critical it is to challenge youth with a social justice issue that is important to them, for example Climate Change. This collaborative STEAM initiative has the flexibility to be molded by its participants, facilitating success among [redacted] students in [redacted] and across Canada.


Smart Cities Challenge Jury, I hope you will select Waterloo Region as the winning city in the Smart Cities Challenge \$50M prize category. The programs developed in Waterloo Region have the potential to scale across the country through Perimeter Institute and its partners. With your support, we look forward to making a difference in the lives of our young people.

Sincerely, [redacted]





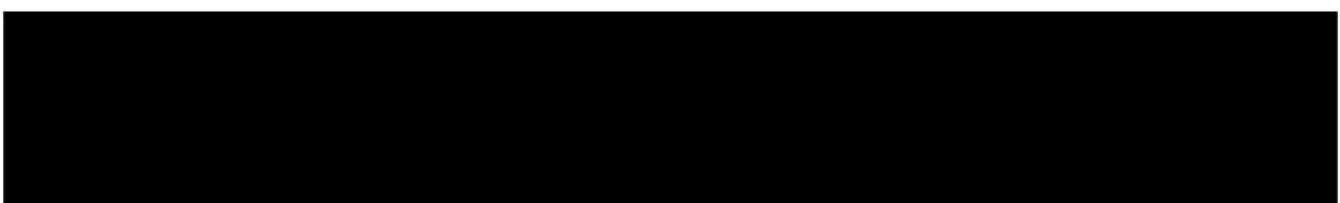
Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3





March 3, 2019

Members of the *Smart Cities Challenge* Jury:

Please accept this letter as  support for Waterloo Region's *Smart Cities Challenge* bid.



 We are eager to expand our existing  program to include a more robust digital literacy component in partnership with Smart Waterloo Region.

We are happy to see that the Phase 2 Smart Waterloo Region consultation around child and youth well-being has further highlighted the importance of  skills and supports. We know first hand the benefits that come from ensuring strong  skills as a foundation to well-being – and we also know the added benefits of focusing on  skills for the family unit. Going forward into implementation of the Smart Waterloo Region initiative, we are excited to work together with Smart Waterloo Region and other community partners, 



Smart Cities Challenge Jury, we hope you will select Waterloo Region as the winning city in the *Smart Cities Challenge* \$50M prize category. With your support, we know we can make a greater difference in the lives of all our young people.

Yours sincerely,



[REDACTED]

February 15, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury

On behalf of [REDACTED] I am writing to express my support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*.

[REDACTED]

We believe the Waterloo Region Smart Cities Challenge initiative will help us access new technology-based opportunities while making a positive impact in the lives of children and youth across Waterloo Region. Specifically, we believe that their proposal to create connected community spaces at libraries and community centres in both urban and rural areas of Waterloo Region will create relevant, meaningful experiences for children and youth that can help build the necessary life skills needed for success.

We are aware of the challenge that Waterloo Region's rural township libraries and community centres face with regards fibre connectivity. A barrier that limits technology enabled programs and services for children and youth. We are also aware that many kids throughout the cities and townships of Waterloo Region do not have access to affordable internet, further preventing technology-enabled development opportunities. Despite these challenges, Waterloo Region is also home to an innovative knowledge-base and technology sectors that is coming together to build solutions for its children and youth. If selected as the winning community through the Smart Cities Challenge, we are excited to potentially partner with Waterloo Region by providing various products and services, which may include some or all of the following:

[REDACTED]

[REDACTED] we recognize the importance of building the infrastructure to ensure children and youth have access to high quality and equal opportunity development opportunities. We believe the Waterloo Region Smart Cities Challenge initiative is an opportunity to achieve that.

I hope you will select Waterloo Region as the winning city in the Smart Cities Challenge \$50M prize category. With your support, we look forward to making a difference in the lives of our young people.

Sincerely,

[REDACTED]

[REDACTED]

February 13, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury:

I am writing to express the strong support [REDACTED]
[REDACTED] for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*.

We believe the Waterloo Region Smart Cities Challenge initiative will help Waterloo Region and other communities across Canada access new opportunities and make a real difference in the lives of children and youth. Specifically, we believe the technology-enabled solutions and community-level data measurement framework implemented during this project will help communities achieve Canada's Sustainable Development Goals (SDGs) for children and youth. Waterloo Region's Smart Cities Challenge initiative will help communities create relevant and meaningful experiences that increase the overall wellbeing for children and youth.

[REDACTED] is committed to supporting the Waterloo Region Smart Cities Challenge initiative and fellow partner, [REDACTED] in building strategies to achieve child and youth SDG targets at the local level. As a partner, [REDACTED] has committed to providing [REDACTED] per year over five years for the Waterloo Region Smart Cities Challenge initiative. This funding will be delivered through in-kind support dedicated to the development/refinement of metrics for understanding and tracking progress on the SDGs at the community level. We also look forward to working with Waterloo Region to share these strategies with other communities across Canada to empower all regions to learn from one another in enhancing the wellbeing of children and youth in Canada.

[REDACTED]

Smart Cities Challenge Jury, I hope you will select Waterloo Region as the winning city in the Smart Cities Challenge \$50M prize category. With your support, we look forward to making a difference in the lives of our young people.

Sincerely,

[REDACTED]

Smarts Cities Challenge Jury
\$50 Million Prize Category
Infrastructure Canada
Ottawa, Ontario

RE: letter of support and confirmation – national scaling opportunity – Waterloo Region bid

Members of the Smart Cities Challenge Jury:

We have reviewed the Waterloo Region's submission of a [REDACTED] technology-enabled framework as part of its bid submission and can collectively confirm that each of our [REDACTED] work with similar newcomer youth in our community. These newcomer youth face the same challenges and opportunities as they do in Waterloo Region and as such, should the framework prove successful there as implemented by our colleagues at the [REDACTED] Cambridge & Kitchener-Waterloo, we are willing to commit the time and attention required to consider how we might replicate the framework in our communities.

[REDACTED] we benefit from working together in communities across the country and have a track record of success in scaling locally driven initiatives across Canada including a national child protection framework, an alternative-suspension program and quality and safety standards in aquatics, outdoor camp just to name a few.

In our experience, if something works well in a [REDACTED] we have the ability and culture to scale effectively.

With support,

[REDACTED]

February 13, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario

RE: letter of contribution and confirmation of in-kind support for Waterloo Region's *Smart Cities Challenge* bid

Members of the Smart Cities Challenge Jury:

On behalf of our Board of Directors, our staff and volunteers, I am enthusiastically adding the voice of [REDACTED] in Waterloo Region in support of our *Smart Cities Challenge* bid.

As a sign of our commitment to the bid, we are pleased to offer the following in-kind support for initiatives included in our proposal:

We are looking forward to working together to realize these important projects in our community. By becoming the winning community for the *Smart Cities Challenge* initiative, we will leverage [REDACTED] in in-kind supports through [REDACTED]

I hope you will select Waterloo Region as the winning city in the Smart Cities Challenge \$50M prize category. With your support, we look forward to making a greater difference in the lives of our young people.

With support,

What [REDACTED] Can Contribute

[REDACTED] has a unique ability to span the worlds of research, R&D, practice and philanthropy. Our ability to unite leaders across the sectors in a common cause would be a seminal contribution to this initiative.

In addition to providing a framework that reflects state-of-the-art thinking in technology specifically related to [REDACTED] practice, this project will include a second phase that develops a roadmap to guide systematic development of apps that are actually needed to fill gaps. Together the framework and roadmap are intended to move the field beyond the current "Wild West" approach where apps of varying quality are developed willy-nilly to a coherent approach to creating appropriately designed tools that actually add value beyond what is currently available.

In short, as a locally based [REDACTED] [REDACTED] can access talent and agencies across Canada and beyond to locally develop, then widely promote, tools needed by emerging integrated youth [REDACTED] services systems. [REDACTED] ability to create partnerships at this level will facilitate creation of top quality informatics tools and scaling these up in practice across Canada and beyond.

[Redacted]

ATIA - 13(1)(d)

ATIA - 19(1)

Sincerely

[Redacted]

[Redacted]

February 19, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Members of the *Smart Cities Challenge* Jury:

[REDACTED] I am enthusiastically adding our voice in support of our community's *Smart Cities Challenge* bid.

[REDACTED]

The needs and experiences in our townships can differ at times from the urban cities in the region, and we have worked to ensure that the voices of rural children/youth/families and professionals have been included in the *Smart Cities Challenge* bid. Going forward into implementation, we are excited to see the following proposed tech solutions which we know will benefit many rural families:

- Improving access to parenting supports for rural families by developing greater and more explicit connection to the *Parenting Now* site.
- Extension of fibre network to our rural libraries and community centres, hotspot borrowing and piloting of 5G to improve the much-needed high-speed internet access in our townships.
- Greater access to programs and supports (including STEAM, literacy, life skills, etc.) via the rural sites included in the Connected Community Spaces efforts.
- The piloting of virtual counselling supports for rural residents.
- Customized programming for [REDACTED] families on internet safety.

We are committed to intentionally collaborating and aligning efforts [REDACTED] to support wherever possible these Smart Waterloo Region projects, as well as any others that emerge, that support rural populations in particular. We are looking forward to working together to realize these important projects in our community, and would like to offer in-kind support from our [REDACTED] staff when possible. By becoming the winning community for the *Smart Cities Challenge* initiative, which means we will leverage up to [REDACTED] in associated additional in-kind supports through the [REDACTED]

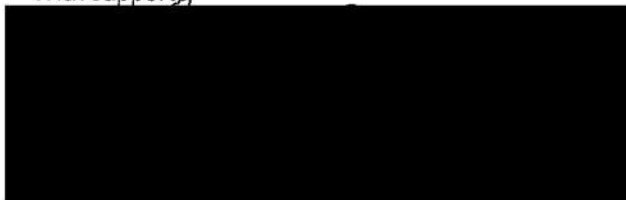
[REDACTED]

ATIA - 13(1)(d)

ATIA - 19(1)

Smart Cities Challenge Jury, I hope you will select Waterloo Region as the winning city in the *Smart Cities Challenge* \$50M prize category. With your support, we look forward to making a greater difference in the lives of all our young people.

With support,



February 21, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

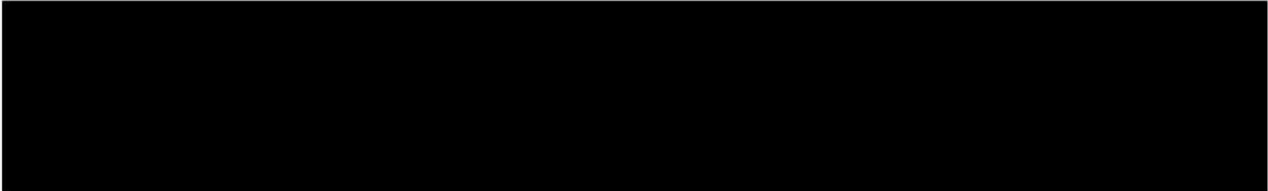
Re: Support for Waterloo Region's Smart Cities Challenge Proposal

Dear Smart Cities Challenge Jury,

On behalf of the Region of Waterloo and the seven area municipalities of Waterloo Region, we would like to express our support for Waterloo Region's Smart Cities Challenge proposal.

Throughout the finalist phase of the Smart Cities Challenge, our community undertook extensive engagement activities with stakeholders and the public to further inform the development of our proposal. Representatives from the social service, technology, non-profit and educational sectors not only participated in engagement activities but also hosted and led information gathering sessions to ensure broader support for our proposal. Working with over 100 partners, we were successfully able to receive input from across the community including parents, caring adults and most importantly, our children and youth. An example of that success can be seen in the letter of support attached to our proposal with over 2000 signatures from youth across Waterloo Region. While we focused our engagement efforts on all children and youth in Waterloo Region, we made special efforts to connect with those furthest from opportunity to ensure our proposed solutions are well-informed and inclusive.

Based on our engagement, we have identified technology and data-enabled solutions that will make a real impact on the lives of our children and youth. We are excited about the opportunity to leverage Smart Cities funding to support a wide range of new child and youth wellbeing projects across Waterloo Region. For example, our proposed Connected Community Space initiative will leverage our libraries and community centres to offer enhanced technology-enabled learning and development opportunities to more children and youth across Waterloo Region.



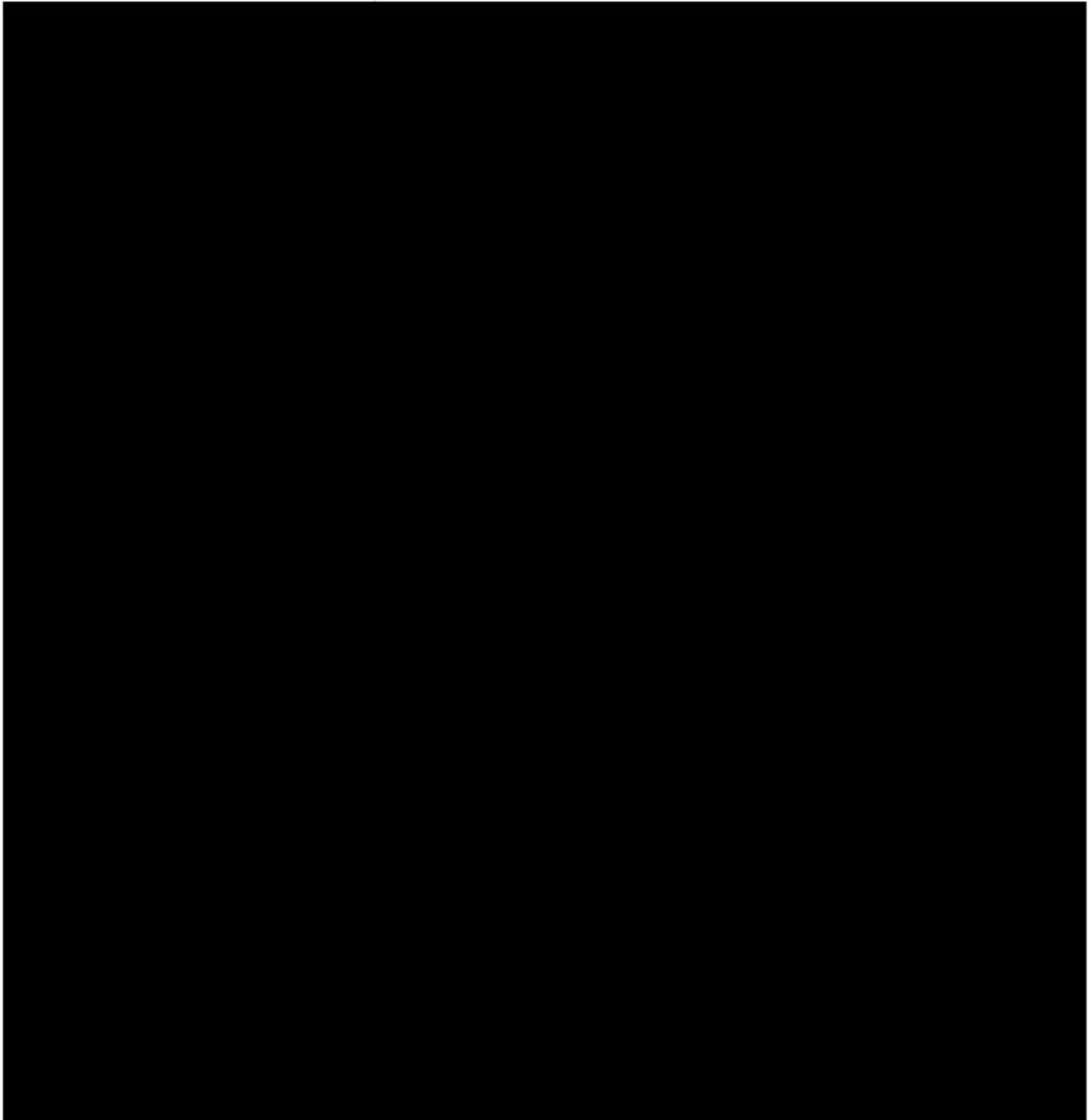
ATIA - 19(1)

ATIA - 13(1)(d)

Working with new provincial and national partners, we look forward to sharing our scalable solutions with other communities across the country. In particular, we have finalized the partnership activities with UNICEF Canada to develop a community-level measurement framework for the new national Child and Youth Wellbeing Index, which UNICEF Canada will share with other communities across Canada.

Smart Cities Challenge Jury, we hope that you will support our proposal to become the best community in Canada for children and youth, which will no doubt have positive impacts on children and youth across Canada.

Sincerely,



[REDACTED]

ATIA - 13(1)(d)

ATIA - 19(1)

February 19, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury,

We are writing to express our collective support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*.

[REDACTED]

We believe the Waterloo Region Smart Cities Challenge initiative will help Waterloo Region access new opportunities and make a difference in the lives of children and youth in our community. Specifically, we believe the networks, technology-enabled programs and products developed and implemented during this project will help us to create meaningful, relevant programming to aid children and youth in the development of meaningful life skills.

We will support the Smart Waterloo Region initiative by working to build capacity in the service delivery organizations supporting the implementation of the initiative. This will include explaining and demonstrating our current model of funding and engagement. [REDACTED] will be an ambassador for the project with the charitable sector as well as our current [REDACTED] Partners.

As an organization dedicated to build both the [REDACTED] community as well as help grow the capacity of the not for profit sector, we know how important it is to pursue social innovation. If we can – as a community – create and maintain a standard of excellence in the well-being and achievement for our children, our sector has access to home-grown employees. We believe the Waterloo Region Smart Cities Challenge is an opportunity for all of our citizens – particularly our children and youth – to grow, to have exceptional opportunities and to prosper.

Smart Cities Challenge Jury, I hope you will select Waterloo Region as the winning city in the Smart Cities Challenge \$50M prize category. With your support, we look forward to making a difference in the lives of our young people.

Sincerely,

[REDACTED]

[REDACTED]

[REDACTED]

ATIA - 13(1)(d)

ATIA - 19(1)

February 8, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury,

I am writing in my capacity [REDACTED] to express my support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's Smart Cities Challenge.

[REDACTED] As a leading community-building organization in Waterloo Region, [REDACTED] is focused on collaborating with partners to identify and meet current and future needs of our community, by enabling social capital and developing creative forward-thinking innovative solutions for place-based philanthropy.

We are excited to be collaborating with the Waterloo Region Smart Cities Challenge initiative and believe it will bring innovative solutions to tackle serious issues affecting the lives of children and youth in Waterloo Region. Specifically, we believe the networks, programs, products and data developed and implemented during this project will help us to create meaningful, relevant programming to aid youth in the development of meaningful life skills. By engaging directly with youth, Waterloo Region's Smart Cities Challenge initiative will help us create relevant, meaningful experiences for youth that address a known root cause issue that children and youth are lacking life skills and they are worried about it. Through this initiative, we expect to forge new partnerships, reach 2,500 more youth a year and increase the life skill capacity of local youth.

[REDACTED] is committed to providing the Waterloo Region Smart Cities Challenge initiative with our support in forging networks within the Region, cooperating with partners in collecting data and implementing innovative technology solutions, and participating in opportunities designed to increase the well-being of children and youth. We look forward to any opportunity to support the implementation of programming as initiatives unfold. In addition, [REDACTED] will contribute granting resources to children and youth initiatives each year over the next five years, and beyond.

[REDACTED] The Smart Cities Challenge is an opportunity for all of our citizens, particularly our children and youth, to grow, to have exceptional opportunities, and to prosper.

Smart Cities Challenge Jury, I hope you will select Waterloo Region as the winning city in the Smart Cities Challenge \$50M prize category. With your support, we look forward to making a difference in the lives of our young people.

Sincerely,

[REDACTED]

[REDACTED]

February 4, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, ON K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

[REDACTED] is proud and excited to support Waterloo Region's proposal for funding through Impact Canada's *Smart Cities Challenge*. The process of developing this proposal has been unique, bringing together potential partners who previously had no common platform through which to connect. We believe that, if successful, the outcome will be meaningful, demonstrable change for children and youth in our region.

[REDACTED]

The entire proposal from Smart Waterloo Region aligns beautifully with [REDACTED] goals and objectives. This is a rare opportunity to amplify work in our areas of focus and ensure that [REDACTED] organizations have the resources to fully participate. Therefore [REDACTED] has committed to prioritizing Smart Cities-related applications in three of our funding envelopes for the 2020 – 2024 period. This includes funds focused on programs for children under thirteen, capital projects, and a dedicated Higher Education envelope that includes applied research. In total, this means that up to [REDACTED] [REDACTED] could be leveraged toward Smart Cities initiatives over the five years.

I have the privilege of sitting on the Smart Waterloo Region Advisory Team, and have seen the incredible potential that this proposal could unlock. I feel [REDACTED] brings a unique perspective, being deeply involved in the community but also holding strong relationships with other foundations focused on children across the country. I am certain that the concepts and prototypes included in our application are not only applicable to other Canadian communities, but would be embraced by them.

Smart Cities Challenge Jury, I hope you will select Waterloo Region as the winning city in the Smart Cities Challenge \$50M prize category. With your support, we look forward to making a difference in the lives of our young people.

Sincerely,

February 25, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario, K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury

We are writing to express our collective support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*.

We believe the Waterloo Region Smart Cities Challenge initiative will help Waterloo Region access new opportunities and make a difference in the lives of children and youth in our community. Specifically, we believe the networks, technology-enabled programs and products developed and implemented during this project will help us to create meaningful, relevant programming to aid children and youth in the development of meaningful life skills. By enabling Waterloo Region's business sector to work closely with child and youth service providers, we will build new partnerships that will ensure our children and youth have the best opportunities ahead of them.

Collectively, we will support the Smart Waterloo Region project with the following contributions:

- Working with community partners to create easier access for youth interested in accessing Waterloo Region's start-up economy
- Facilitating partnerships with Waterloo Region's companies and child and youth service providers to support mentoring opportunities for youth

We know how important it is to have access to a skilled talent pool. If we can – as a community – create and maintain a standard of excellence in the well-being and achievement for our children, our sector has access to home-grown employees. And that's important for our future growth. We believe the Waterloo Region Smart Cities Challenge is an opportunity for all of our citizens – particularly our children and youth – to grow, to have exceptional opportunities and to prosper.

Smart Cities Challenge Jury, I hope you will select Waterloo Region as the winning city in the Smart Cities Challenge \$50M prize category. With your support, we look forward to making a difference in the lives of our young people.

Sincerely,



[REDACTED]

February 19, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury

[REDACTED] we are writing to
express our support for Waterloo Region's Smart Cities Challenge proposal for funding
through Impact Canada's *Smart Cities Challenge*.

[REDACTED]

We believe the Waterloo Region Smart Cities Challenge initiative will help us access new opportunities and make a huge difference in the lives of children, youth, parents and caring adults in Waterloo Region. Specifically, we believe the networks, programs, products and data developed and implemented during this project will help us to create meaningful, relevant technology-enabled programming to aid youth in the development of meaningful life skills. We also believe that these technologies and service enhancements will benefit the parents and caring adults who support our children and youth. We all know that parents and other caring adults are vital to the healthy development and wellbeing of children and youth. By enabling organizations like ours to work with tech firms, youth, and parents, Waterloo Region's Smart Cities Challenge initiative will help us create relevant, meaningful experiences for youth that address a known root cause: that children and youth are lacking life skills and are worried about it. It will also help parents and caring adults increase their capacity to meaningfully support the children and youth in their lives.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Specifically, we look forward to supporting the further development and evolution of the Parenting Now site. By working with key partners [REDACTED], we look forward to scaling up this site on a better platform, equipping it with chatbot features for questions and answers, discussion forums, connections to further parenting support services and resources and working with more service delivery partners to increase access - particularly for newer parents, and those living in rural areas.

We are looking forward to working together to realize these important supports for families in our community. By becoming the winning community for the *Smart Cities Challenge* initiative, we would leverage an additional contribution from [REDACTED] in in-kind supports.

Smart Cities Challenge Jury, we hope you will select Waterloo Region as the winning city in the Smart Cities Challenge \$50M prize category. With your support, we look forward to making a difference in the lives of our young people.

Sincerely,

[REDACTED]

January 31, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury:

I am writing to express [REDACTED] whole-hearted support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*.

[REDACTED]

[REDACTED]

[REDACTED] is supporting the Waterloo Region Smart Cities Challenge because the state of Canada's children is not what we should expect in one of the world's most prosperous countries. Canada ranks 25th of 41 rich countries in overall child and youth well-being measured against 21 indicators of health, violence, material security and other Sustainable Development Goal targets. We can move this needle, and Waterloo Region is taking leadership to demonstrate how at the community level, smart solutions for and with young people can play a key role advancing the well-being of children and the social, economic and environmental situation of the whole community. I believe this bold goal will inspire other cities to tackle challenging social issues, demonstrate that progress is possible, and show that smart solutions are friendly for young people. I am confident that the focus on children and youth will bring social and economic benefits that address some entrenched community challenges: inclusion, equity, learning, health and employment.

[REDACTED] is supporting the impact of the Waterloo Region Smart City in many ways:

[REDACTED]

[REDACTED]

- The Canadian Index of Child and Youth Well-being provides a clear standard to support assessing the state of children and youth, setting targets, collecting data, deciding actions and monitoring results. Because the Index embeds indicators aligned with the official targets relevant to children and youth for the Sustainable Development Goals, it will also support the Region of Waterloo to track its progress to achieve these targets, while modelling the most relevant approach for other communities and supporting them to play their part in Canada's SDG Agenda. [REDACTED] will collaborate with the Region of Waterloo to adapt the Index to a community dashboard and survey tools for real-time data collection and use.
- [REDACTED] is attracting additional partners and resources to support this work, including a partnership with the [REDACTED] to invest in the development of a community survey of children and youth that will support critical data collection in the region, innovate new approaches to engaging youth in the process to address key challenges including the potential to adapt [REDACTED] youth polling and engagement platform, [REDACTED] for city decision-making, and build capacity to use them in other communities.
- Data privacy and security are prominent issues for Smart Cities. [REDACTED] will leverage and contribute our organization's global leadership to define and support the rights of children in relation to data across all stages of the data cycle, including protection and participation.
- [REDACTED]
[REDACTED] This will enable public recognition of local government investments and goals to improve the conditions and quality of life for children and youth, contributing to federal efforts to reduce poverty and promote social inclusion.

[REDACTED] has a large network of socially engaged Canadians: we will communicate exciting progress to inspire bold goals and projects for children in communities and cities across the country; our wide network of influential organizations including [REDACTED] will also be engaged to learn new smart approaches to boldly advance the well-being of children and youth.

Yours truly,

[REDACTED]



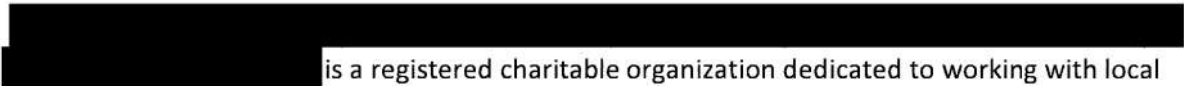
February 21, 2019

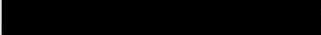

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3


Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury,

Please accept this letter as my support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*. The process of working on the proposal has brought together multiple sectors and we are having conversations we have never had before. It has been a really unique opportunity so far, and I look forward to what is still to come.



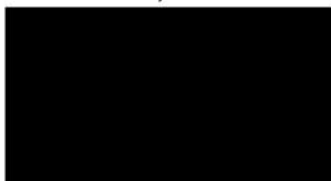
 is a registered charitable organization dedicated to working with local agencies, networks, collaboratives, and programs to tackle difficult issues that are standing in the way of people in our community having the best possible quality of life. We target funding in three key areas: Vulnerable children and youth; Poverty; and Neighbourhoods. We currently invest  in our community in programs to improve the lives of children, youth, families, and individuals. As voting members of the Children and Youth Planning Table of Waterloo Region, we are working alongside many other organizations to positively impact children and youth, and engage them in the community. Additionally, we have been involved in Wellbeing Waterloo Region since its inception and work to ensure a cross-sectoral approach in each of the three Big Ideas – Healthy Child and Youth Development, Social Inclusion, and Affordable Housing. We are committed to working with others in this community to make it the best place to live, learn, work, and play.



We believe the Waterloo Region Smart Cities Challenge initiative will help us access new opportunities and make a difference in the lives of children and youth in Waterloo Region. Specifically, we believe the networks, programs, products and data developed and implemented during this project will provide meaningful, relevant, accurate information to help inform funding decisions and influence further collaborative work on root causes of many social issues. By enabling organizations like ours to work with tech firms and youth, Waterloo Region's Smart Cities Challenge initiative will help us support informed, relevant, meaningful programs, projects, and services for youth, based on local data. Through this initiative, we expect to have a better understanding of the existing needs for youth and more creative ways to work differently across sectors for better outcomes. Additionally, we will use this information as key criteria for future funding and as a platform for community discussions on how to best serve local children and youth. We also believe it will help us attract new donors because of the new approaches to problem solving, which then benefits the community through more granting opportunities.

Smart Cities Challenge Jury, I hope you will select Waterloo Region as the winning city in the Smart Cities Challenge \$50M prize category. With your support, we look forward to making a difference in the lives of our young people.

All the best,



[REDACTED]

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Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury:

[REDACTED] I express my strong support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*.

[REDACTED]

In this capacity, we offer support to Waterloo Region's Smart Cities initiative by providing the means to discover and implement highly innovative forms of engaging the young user demographic for whom the Region's initiative is intended. This demographic understands the world of games, gamification, and VR/AR thoroughly, having embraced these technologies, through smartphones and game consoles, from a very young age. These technologies and their associated media can help teach, train, and understand and modify behaviour, and the researchers [REDACTED] will work with the Smart Cities initiative to create and assess interactive experiences for this purpose.

[REDACTED]

To these ends, the [REDACTED] commits in-kind support in the amount of [REDACTED] per year [REDACTED]. This includes the time of the Executive Director, the Associate Director, at least one [REDACTED] and [REDACTED] staff, along with space and equipment for events, for a youth audience, in which they can view and experience the apps. We are excited at being able to make this commitment, and to working with this extremely important initiative.

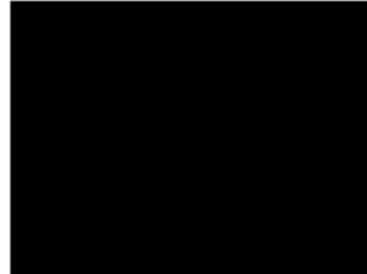
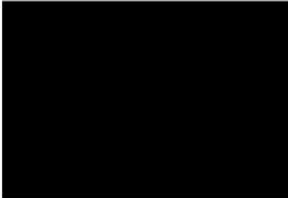
Sincerely,

[REDACTED]

[REDACTED]

ATIA - 13(1)(d)

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February 8, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3


Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury,

I am writing to express my support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*.



The Waterloo Region Smart Cities Challenge initiative will help advance new research and findings on child and youth wellbeing that will support Waterloo Region's goal to become the best community for kids in Canada. Specifically, the networks, programs, products and data developed and implemented during this project will be supported with the research that is required to stay at the forefront of child and youth wellbeing.

My own specific contribution to this initiative, which includes input from my  collaborators, will focus on the proposed Digital Citizenship Strategy for Children and Youth. This project will help Waterloo Region children, youth, and their caregivers to more fully understand the benefits and potential

pitfalls of living in a society that is increasingly shaped by digital networks and devices. The Digital Citizenship strategy will outline the various relationships between technology and wellbeing, including physical and mental health, cognitive development, and social skills. [REDACTED] is committed to providing the Waterloo Region Smart Cities Challenge initiative with our support in undertaking research, working with partners, sharing and disseminating information sharing, and strategy development.

Through this research, [REDACTED] is committed to providing [REDACTED] per year over five years for the Waterloo Region Smart Cities Challenge initiative. [REDACTED]

[REDACTED] We are also committed to providing support in forging networks within the Region, cooperating with partners in collecting data and implementing innovative technology solutions, and participating in opportunities designed to increase the well-being of children and youth.

Thank you very much for your consideration of this exciting project.

Sincerely,

[REDACTED]

15 February 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

RE: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury,

I am delighted to provide this letter of support for the Region of Waterloo Smart Cities proposal for funding through Impact Canada's *Smart Cities Challenge*, which seeks to improve early childhood development, literacy, youth mental health, and sense of belonging in the Region and beyond. The Region's specific goal is to become the best community for kids in Canada, and I look forward to using my research expertise to contribute to evaluating different components of their smart city intervention on youth health.

[REDACTED]

I am thrilled to partner with the Smart Waterloo Region team and community partners on the SMART Prevention research program (Smart Municipal Action, Research, and Translation for Disease and Injury Prevention). [REDACTED]
[REDACTED] looking forward to working with the Region to using our evidence-based smart phone app to both *monitor* and *intervene* on built environment exposures that support youth mental health. [REDACTED]

[REDACTED]

[REDACTED] We are committed to providing research and evaluation support to the Region and to actively engaging in opportunities designed to increase the well-being of children and youth. As [REDACTED] we have access to a wide pool of highly qualified trainees who are interested in this topic: [REDACTED]
[REDACTED]. The current opportunity to connect [REDACTED] with "real life" experience working with the Waterloo Region Smart Cities Challenge team is truly exciting.

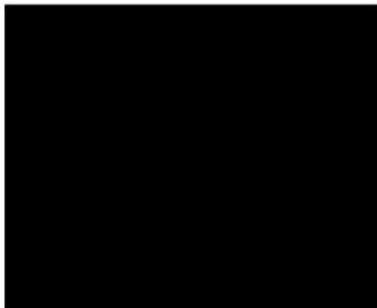
[REDACTED]

[REDACTED] We are committed to

[REDACTED]

continuing to work with the Region is designing cutting-edge research to thoroughly investigate the impacts of Regional investments in Smart Cities programs on youth health and well-being outcomes.

Sincerely,



February 14, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury,

I am writing to express my support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*. [REDACTED]

[REDACTED]

[REDACTED] This work directly aligns with Waterloo Region priority areas, including early childhood development and youth mental health.

The Waterloo Region Smart Cities Challenge initiative will help advance new research and findings on child and youth wellbeing that will support Waterloo Region's goal to become the best community for kids in Canada. Specifically, the networks, programs, products and data developed and implemented during this project will be supported with the research that is required to stay at the forefront of child and youth wellbeing.

I am excited to partner with the Waterloo Region Smart Cities Challenge initiative and community partners on a variety of research projects, including ongoing collaborations [REDACTED]

[REDACTED] committed to providing the Waterloo Region Smart Cities Challenge initiative with our support in forging networks within the Region, cooperating with partners in collecting data and implementing innovative technology solutions, and participating in opportunities designed to increase the well-being of children and youth. We look

[REDACTED]

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forward to any opportunity to support the implementation of programming as initiatives unfold.


Through this research, I have committed to providing [REDACTED] per year over five years for the Waterloo Region Smart Cities Challenge initiative, [REDACTED]

[REDACTED] We are also committed to providing support in forging networks within the Region, cooperating with partners in collecting data and implementing innovative technology solutions, and participating in opportunities designed to increase the well-being of children and youth.

Sincerely,

[REDACTED]

[REDACTED]



ATIA - 13(1)(d)

ATIA - 19(1)

February 13, 2019

Smart Cities Challenge Jury
c/o Regional Municipality of Waterloo
150 Frederick Street
Kitchener, ON

Re: Smart Cities Waterloo Region

Dear Jurists,

It is with excitement and enthusiasm that [REDACTED] is providing this letter of support for the Region of Waterloo Smart Cities initiative. [REDACTED]

[REDACTED] we have seen this initiative grow out of a significant amount of collaboration, dialogue and action in support of children and youth in our Region.

[REDACTED]


Due to the success of our youth engagement program we were invited [REDACTED] to provide resources and leadership [REDACTED]

[REDACTED] This opportunity exposed our staff to good-practices in youth engagement from across Canada. It also opened our eyes to the breath of what can still be accomplished if we can continue to work together.

The Region of Waterloo proposal to Smart Cities is an impressive opportunity to really move the needle for Children and Youth in Waterloo Region. Through our ongoing partnership [REDACTED] we have the opportunity to grow the investment of Smart Cities by sharing the resources and learnings developed with volunteer centres and voluntary sector organizations across Canada. W

We are excited for this opportunity.

Sincerely,



ATIA - 13(1)(d)

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Monday, February 11, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge


Dear Smart Cities Challenge Jury

We are writing to express our collective support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*.

We believe the Waterloo Region Smart Cities Challenge initiative will help Waterloo Region access new opportunities and make a difference in the lives of children and youth in our community. Specifically, we believe the networks, technology-enabled programs and products developed and implemented during this project will help us to create meaningful, relevant programming to aid children and youth in the development of meaningful life skills. By enabling Waterloo Region's technology companies to work closely with child and youth service providers, we will build new partnerships that will ensure our children and youth have the best opportunities ahead of them.

Collectively, we will support the Smart Waterloo Region project with the following contributions:

- Working with community partners to create easier access for youth interested in accessing Waterloo Region's start-up economy
- Facilitating partnerships with Waterloo Region's technology companies and child and youth service providers to develop technology-enabled programming
- Working with community partners to create a digital citizenship strategy for Waterloo Region's children and youth
- Use of our space to support engagement activities and STEAM training relating to the Smart Waterloo Region project

 we know how important it is to have access to a skilled talent pool. If we can – as a community – create and maintain a standard of excellence in the well-being and achievement for our children, our sector has access to home-grown employees. And that's important for our future growth. We believe the Waterloo Region Smart Cities Challenge is an opportunity for all of our citizens – particularly our children and youth – to grow, to have exceptional opportunities and to prosper.

Smart Cities Challenge Jury, I hope you will select Waterloo Region as the winning city in the Smart Cities Challenge \$50M prize category. With your support, we look forward to making a difference in the lives of our young people.

Sincerely,



[REDACTED]

January 28, 2019.

To: Smart Cities Challenge Jury

Dear Members of the Smart Cities Challenge Jury,

[REDACTED] we
monitor social trends and legislative changes, conduct research, and collaborate with key players including businesses, educational institutions, not-for-profit organizations, and government departments.

Over the past few years, [REDACTED] has worked [REDACTED] on research related to youth engagement, employer-supported volunteering, volunteering and older adults and, most recently, the link between volunteering and the Sustainable Development Goals. The link between volunteering and the Sustainable Development Goals is of particular relevance to youth engagement and will be integrated into the work we do with [REDACTED] as part of the Smart Cities initiative.

[REDACTED] provides a centralized search space for youth around the country to find volunteer opportunities, based on their interests, skills, and personal goals. It also provides tools to guide the search and resources for organizations to build their capacity to engage youth. [REDACTED]

[REDACTED] has greatly benefitted from innovations that have come from the Region of Waterloo, in terms of technology, youth engagement, and linkages with educational institutions. The leadership [REDACTED] [REDACTED] has been instrumental in testing out new solutions and bringing them [REDACTED] to share across the country. The Smart Cities initiative will build upon our existing relationships and access our respective strengths. [REDACTED] will also be providing an estimated [REDACTED] in-kind support, as we scale up the innovative youth engagement activities developed through the Smart Cities initiative.

Please let us know if you have any further questions.

Best wishes on this initiative.

[REDACTED]

[REDACTED]

ATIA - 13(1)(d)

ATIA - 19(1)

February 8, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury

I am writing to express my support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's Smart Cities Challenge.

[REDACTED]

[REDACTED] will collaborate with Waterloo Region's Cities Challenge by providing youth of all ages to engage in entrepreneurial programs, training, mentors and access to industry leaders and experts. Our programs surround youth with a supportive team of caring professionals dedicated to helping them to overcome challenges, build confidence, self-esteem, and provide opportunities to create a brighter future. Through this initiative, we expect to forge new partnerships, reach 1,500 more youth a year and increase the life skill capacity of local youth.

[REDACTED] is committed to providing the Waterloo Region Smart Cities Challenge initiative with our support in forging networks within the Region, cooperating with partners in collecting data and participating in opportunities designed to increase the well-being of children and youth.

Smart Cities Challenge Jury; I hope you will select Waterloo Region as the winning city in the Smart Cities Challenge \$50M prize category. With your support, we look forward to making a difference in the lives of our young people.

Sincerely,

[REDACTED]

[REDACTED]

Smart Cities Challenge Jury

c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury

It is with sincere enthusiasm that we write this letter to indicate our strong support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*. We know the work captured here can be a model for any and all regions/cities across our great country, and have full confidence in its potential to significantly influence our most valuable resources of all - the children and youth across Waterloo Region.

[REDACTED]

[REDACTED] Specifically, we are exploring alternatives to suspension, programs that proactively build resilience in our youth, experiential learning connected to STEAM and girls, and [REDACTED] that is intended to foster engagement and innovation, particularly in our neediest [REDACTED] communities. We have made significant in-kind commitments of budget and resources, as we know that the partnerships forged, resources and programs provided, and the alternate solutions to disengaged youth [REDACTED] will provide as part of the *WR SMART Cities* proposal, will be life-changing for many [REDACTED]

[REDACTED]

[REDACTED] Thus, we are pledging to offer initiative [REDACTED] to allow for expansion of alternative programming [REDACTED] so that all geographic areas of our region have equitable and accessible programs in relation to alternatives to suspension and resiliency initiatives. In terms of [REDACTED] infrastructure, we will be leaning heavily on the proposal, but will be making [REDACTED] funded contributions into remaining [REDACTED] not captured by the SMART Cities funding, as noted above. It should also be re-emphasized that we are also committed to continuing to forge strong networks within the Region, cooperating with all affiliated partners in collecting data (mindful of our privacy obligations) and implementing innovative technology solutions, and to participating in all opportunities designed to increase the well-being of children and youth.

[REDACTED]

[REDACTED] we feel we can knowledgeably and authentically comment on the complex challenges that exist to bring all children and youth to their preferred future. There is nothing more seminal to us than the spiritual, social and emotional well-being and success of our students. A child who [REDACTED] with hope and fulfills their potential to give back to their community is indeed core to why we exist. Our involvement in this

[REDACTED]

WR SMART Cities proposal will greatly improve our trajectory in this regard. It is not only good for Waterloo [REDACTED] it is good for Waterloo Region, for Ontario and indeed all of Canada. Our mission statement indicates that [REDACTED] [REDACTED] we know with the partnership, innovation, care and thought that informs this proposal, that goal will be greatly supported.

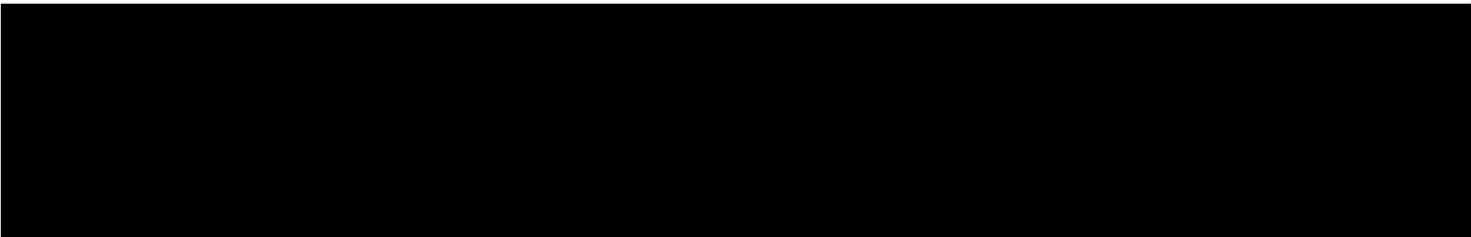
We are thrilled to be part of this proposal and whole-heartedly believe in its potential to be truly transformative. It is our sincere and fervent hope that the Smart Cities Challenge Jury will select Waterloo Region as the winning city in the Smart Cities Challenge \$50Million prize category. With your support, we look forward to making a profound and lasting difference in the lives of our young people.

Sincerely,

[REDACTED]

[REDACTED]

[REDACTED]



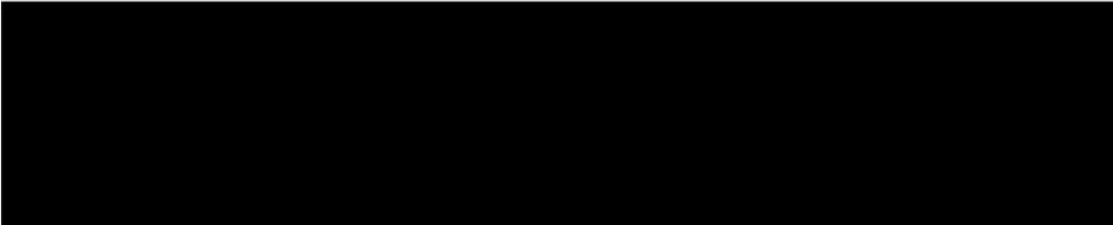
February 19, 2019


Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3


Re: Support for Waterloo Region's Smart Cities Challenge

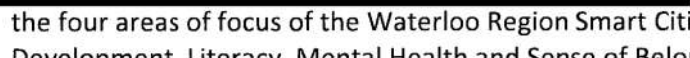

Dear Members of the Smart Cities Challenge Jury,


We are writing to express our strong support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*.



Here in Waterloo Region we have an opportunity to address complex issues around child and youth well-being, and to work in partnership using this proposal's collaborative, interdisciplinary approach with the Waterloo Region Smart Cities Challenge. Leading  programs such as Education, Psychology, Health Sciences and Social Work are already engaged with the initiative.



 n research funding addressing the four areas of focus of the Waterloo Region Smart Cities Challenge: Early Childhood Development, Literacy, Mental Health and Sense of Belonging. We estimate an additional  in new research grants can be achieved through partnership with the Smart Cities Challenge over the next five years. This funding will strongly support the success of this proposal.



[REDACTED] passionately committed to this initiative. Support for this proposal will improve the well-being of our children and youth within Waterloo Region and the rest of Canada. Building on [REDACTED] long-standing and well-established emphasis on experiential learning and community engagement, support for the implementation of Waterloo Region's Smart Cities Challenge can be integrated into [REDACTED]

creating the leaders of tomorrow who will be eager to support the implementation of Waterloo Region's Smart Cities Challenge. On an annual basis, thousands [REDACTED] are involved in meaningful community-engaged learning programs with expert guidance. Our programs and research centres, [REDACTED]

work directly with, and for communities to meet these Challenges head-on and continually work to impact policy and implementation of programs across the Region. We see a significant opportunity and are excited to partner with this initiative and provide opportunities for more [REDACTED] to solve challenges related to child and youth well-being in our community.

The new collaborative partnerships cultivated through this work, including new ways to mobilize and enhance data and knowledge sharing, will create a benchmark model for Canadian communities. With our significant research networks stretch across the country, including the north, we look forward to sharing our experiences and findings with academics, policy makers and front-line organizations, to provide evidence-based ways to help children and youth in their communities to thrive.

We are confident that Waterloo Region proposal is a worthy candidate for the Smart Cities Challenge \$50M prize and we look forward to leveraging our resources and efforts to make a difference in the lives of children and youth in our community, and across Canada.

Sincerely,

[REDACTED]

February 13, 2019

Smart Cities Challenge Jury
C/O Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury

We would like to express [REDACTED] support for Waterloo Region's Smart Cities Challenge proposal as part of Impact Canada's *Smart Cities Challenge*.

We are providing a joint letter of support [REDACTED]

We believe the Waterloo Region Smart Cities Challenge initiative aligns directly with our strategic plan and will help us grow and access new opportunities and make a huge difference in the lives of children and youth in Waterloo Region. Specifically, we believe the technology and data-enabled networks, programs and products developed and implemented during this project will help us to create meaningful, relevant programming to aid youth to;

- re-engage in school and their broader community;
- develop meaningful literacy, numeracy, life and social emotional skills;
- further their equity consciousness; and
- improve their access to timely mental health supports and resources.

[REDACTED]

By supporting organizations like ours to work with tech firms, community organizations and youth, Waterloo Region's Smart Cities Challenge initiative will help us better understand and respond to known root cause issues that create barriers to better well-being outcomes for children and youth. Through this initiative, we expect to forge new partnerships, improve the self-regulation, literacy and numeracy skills [REDACTED] increase [REDACTED] improve child and youth well-being, as measured [REDACTED] and provide [REDACTED] with meaningful and relevant opportunities to develop applicable life skills.

[REDACTED] is committed to providing the Waterloo Region Smart Cities Challenge initiative with our support in forging networks within the Region, cooperating with partners in collecting data and implementing innovative technology solutions, and participating in opportunities designed to increase the well-being of children and youth. We look forward to any opportunity to support the implementation of programming as initiatives unfold. We are also committed to providing in-kind support of staff time, meeting space and expertise with a total value of approximately [REDACTED]

[REDACTED] staff has had the opportunity to be part of and engage with representatives from the Waterloo Region Smart Cities Advisory Team. We are excited about the potential we have – as a community – to make a difference and to leverage our strengths to create a long-term, meaningful impact for all children and youth within our Region and beyond. We are eager to share what we learn and how our models can be scaled to support other communities across Canada.

Smart Cities Challenge Jury, your consideration and selection of Waterloo Region's Smart Cities proposal will make a difference in the lives of our young people and in the future of Canada.

Sincerely,

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

February 19, 2019

Smart Cities Challenge Jury
c/o Government of Canada, Impact and Innovation Unit
85 Sparks Street
Ottawa, Ontario
Canada K1A 0A3

Re: Support for Waterloo Region's Smart Cities Challenge

Dear Smart Cities Challenge Jury:

I am writing to express my support for Waterloo Region's Smart Cities Challenge proposal for funding through Impact Canada's *Smart Cities Challenge*.

[REDACTED] I am privileged to see the positive impact that great leadership from the Regional Municipality of Waterloo has on our community.

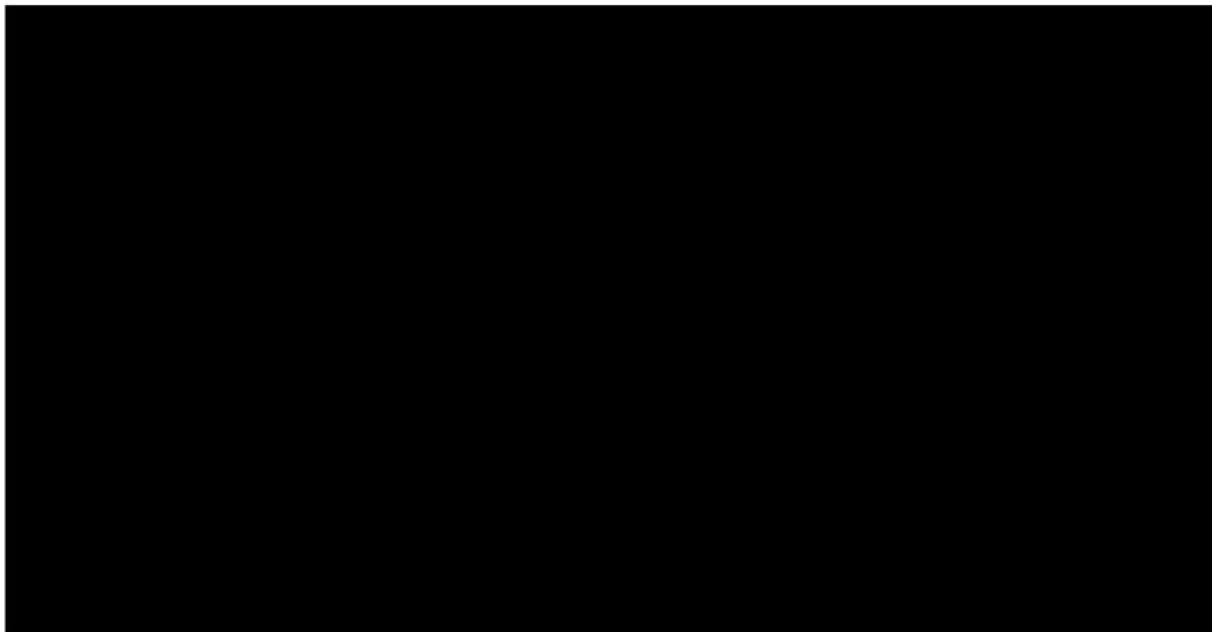
[REDACTED]

In Waterloo Region, we are known for being very innovative and inclusive. Our 'barnraising' culture promotes community-based collective impact initiatives, and when one sector makes a call to action, we all step forward to help. The Waterloo Region Smart Cities Challenge Initiative is a perfect opportunity for us to make a huge difference in the lives of children and youth in Waterloo Region.

[REDACTED] is committed to providing the Initiative our support engaging stakeholders and partners, collecting data, analysis and research, implementing new technology solutions and leveraging existing technologies in innovative ways to support the well-being of children and youth in our Region.

[REDACTED]

[REDACTED] Many of the solutions that we have in use in Ontario are not available or adapted for children and youth. We have identified existing technologies that, if focused on our child and youth populations, would greatly improve their well-being. [REDACTED]



I am excited about the potential we have as a community to make a significant difference to the lives of so many. [REDACTED] for our most complex young residents and an active participant and advocate for mental health supports for youth I am excited about the opportunities for our Region as we undertake the Smart Cities Challenge.

To you, the Jury, I hope you will see the merit in such broad support from all sectors and select Waterloo Region as the winning community in the Smart Cities Challenge. With your support, we commit to making a difference in the lives of our young people and won't let you down.

Sincerely,



Edmonton
(no reviewed)

Jacaban2, Evalynne (INFC)

From: SC / VI (INFC)
Sent: March 7, 2019 3:03 PM
To: Soumya Ghosh
Subject: RE: Smart Cities Challenge - Successful Final Proposal Submission

Hi Soumya,

The availability of the final proposals online are a core component of the openness and transparency of the Challenge. Our intention is that all final proposals will be made public one way or another, but we are asking finalists to host theirs for logistical reasons. If some are not able to, INFC will pursue alternative means to have those proposals online.

At this point, 17 out of 20 finalists have already posted their final proposals and videos, and we have had no indication from the remaining finalists that they will not be posting it.

Please let us know if you'd like to discuss this further.

Smart Cities Challenge Team
Infrastructure Canada
infc.sc-vi.infc@canada.ca

From: Soumya Ghosh [mailto:soumya.ghosh@edmonton.ca]
Sent: March 7, 2019 12:36 PM
To: Hwang, Susan (INFC) <susan.hwang@canada.ca>; SC / VI (INFC) <infc.sc-vi.infc@canada.ca>
Subject: Fwd: Smart Cities Challenge - Successful Final Proposal Submission

Hello,

After reading the email below, I am not sure if the release of the proposals to the public is optional and not a requirement. Could you please confirm?



Thank you,



Soumya Ghosh
DIRECTOR
DIGITAL ENABLEMENT
FINANCIAL AND CORPORATE SERVICES | OPEN CITY AND TECHNOLOGY

MOBILE

City of Edmonton
14 Floor Century Place
9803 102A Ave
Edmonton AB T5J 3A3

Thank you.

Smart Cities Challenge Team

Infrastructure Canada

infc.sc-vi.infc@canada.ca

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COMPLETE CHECK FOR FINAL PROPOSAL

FINALIST: Edmonton				
ASSESSED BY: Susan Hwang				
VALIDATED BY: Alex Long				
APPROVAL BY: Eric Poirier				
DATE OF COMPLETION: March 5, 2019				
REQUIREMENTS	COMPLETED	IF NOT COMPLETED, NOTE REASON	GUIDING PRINCIPLES	ACTIONS
SUBMISSION				
Submitted to infc.sc-vi.infc@canada.ca by 23:59 PST on March 5, 2019	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> No extensions will be granted No exceptions will be made for lateness or technical problems (finalist must be able to show evidence of submission) 	<ul style="list-style-type: none"> # to contact finalist If not resolved, # to flag to DG for decision
Final proposal is submitted	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> No extensions will be granted There is flexibility on the finalist video until the end of the week 	<ul style="list-style-type: none"> Assessor to save everything in designated folders # to contact finalist if anything is missing If not resolved, # to flag to DG for decision
Finalist video is submitted	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> There is flexibility on the finalist video until the end of the week 	<ul style="list-style-type: none"> Assessor to save everything in designated folders # to contact finalist if anything is missing If not resolved, # to flag to DG for decision
Preliminary Privacy Impact Assessment or Preliminary Rationale Analysis	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> No extensions will be granted 	<ul style="list-style-type: none"> Assessor to save everything in designated folders # to contact finalist if anything is missing If not resolved, # to flag to DG for decision
FINAL PROPOSAL				
Written in one of Canada's official languages	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> If the final proposal is submitted in a language other than English or French, a companion version in English or French is required from the finalist 	<ul style="list-style-type: none"> # to extract the executive summary from the final proposal and send it to translation (if a French final proposal, send the entire document to translation)
Generally readable (e.g. picture is not covering text, text are not overlapping)	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> If there are serious formatting issues that hinders readability, the finalist may need to resubmit 	<ul style="list-style-type: none"> # to do a scan of the final proposal and verify that all text and tables, graph, etc. could be read
Text-based and in either MS Word (.doc or .docx) or a fully readable, searchable, and selectable PDF (.pdf) format	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> Finalist may adjust the format for INFC posting purposes after the deadline 	<ul style="list-style-type: none"> # to verify with Comms if format is suitable for posting, given INFC web accessibility standards If not suitable, # to contact finalist
No longer than 75 pages* (Financial chapter exempted) and in 12 point font	<input checked="" type="checkbox"/>	3 more pages: 2 pages for gantt chart, attached as an appendix to FP; 1 page for back cover page; within reasonably acceptable variance	<ul style="list-style-type: none"> Finalist cannot adjust content after the deadline If the text overall is smaller than 12 point font, INFC will adjust and evaluate within the new page count 	<ul style="list-style-type: none"> # to notify finalist if final proposal is over 75 pages # to notify finalist if INFC had to adjust the font and page count

Contains an executive summary	<input checked="" type="checkbox"/>			<ul style="list-style-type: none"> # to QC and save translated version into the designated folder
Organized by these distinct chapters (not limited to these; not necessarily in the same order): <ul style="list-style-type: none"> Vision Performance measurement Project management Technology Governance Engagement Data and privacy Financial Implementation phase requirements 	<input checked="" type="checkbox"/>	<i>Also make a note of other chapters, if any</i>	<ul style="list-style-type: none"> Finalist must have these chapters Finalist can have more chapters Finalist can change the order of the chapters 	<ul style="list-style-type: none"> If the chapters are not clearly labeled, # to do a light analysis of where the content may be and make a note for the Jury
FINALIST VIDEO				
No longer than five minutes	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> Finalist may cut down the time for INFC posting purposes after the deadline 	<ul style="list-style-type: none"> # to notify finalist if video is longer than five minutes and needs cutting down
Submitted as a file or in a downloadable format	<input checked="" type="checkbox"/>	Technical issue: audio only when viewed as a file; issue fixed internally	<ul style="list-style-type: none"> Finalist may adjust the format for INFC posting purposes after the deadline 	<ul style="list-style-type: none"> # to verify with Comms if format is suitable for posting, given INFC web accessibility standards If not suitable, # to contact finalist
CONFIDENTIAL ANNEX (OPTIONAL)				
Submitted if and only if required	<input type="checkbox"/>	N/A		<ul style="list-style-type: none"> # to flag with DG if confidential annex is lengthy

Beute, Shantel (INFC)

From: Wendy Gnenz <wendy.gnenz@edmonton.ca>
Sent: March 4, 2019 5:22 PM
To: SC / VI (INFC)
Cc: Hwang, Susan (INFC); Soumya Ghosh
Subject: City of Edmonton Smart Cities Challenge Finalist Submission (1 of 2)



Good afternoon,

It is with great enthusiasm I submit the City of Edmonton's Smart Cities Challenge Finalist Package (email 1 of 2), which includes the following materials:

- 1 - Final Proposal (email 1 of 2)**
- 2A - Finalist Video (email 1 of 2)**
- 2B - Finalist Video Closed Captioning file (email 1 of 2)**
- 3 - Preliminary Privacy Impact Assessment (email 2 of 2)
- 5 - Accessibility Materials (email 2 of 2)

Please note, we have not included 4 - Confidential Annex as all materials were included in the above files.

The Final Proposal, Finalist Video and Finalist Video Closed Captioning are included in the Google folder accessible by SmartCitiesCanada@gmail.com.

Our Finalist Submission demonstrates the City of Edmonton's capacity to create and nurture a resilient, livable, and workable city through technology, partnerships and social innovation.

We look forward to receiving questions from the Smart Cities Challenge Jury. Please acknowledge receipt of this email and access to all attachments. Once you have downloaded the files please let me know.

Warm Regards,



Wendy Gnenz, [REDACTED]
 BRANCH MANAGER
 FINANCIAL AND CORPORATE SERVICES | OPEN CITY AND TECHNOLOGY

City of Edmonton
 1400, Century Place
 9803 102A Ave NW
 Edmonton, AB T5J 3A3

[REDACTED] Office
 [REDACTED] Cell



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From: SC / VI (INFC)
Sent: March 4, 2019 5:29 PM
To: Wendy Gnenz
Cc: Soumya Ghosh
Subject: RE: City of Edmonton Smart Cities Challenge Finalist Submission (2 of 2)

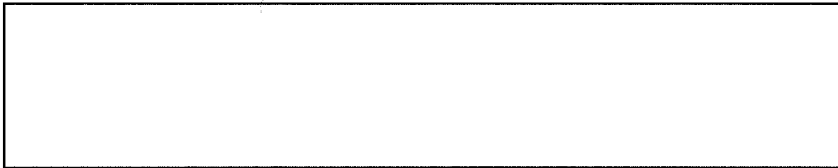
Hello,

Thank you for your submission. Please consider this email as acknowledgement of receipt. We will follow up with you to confirm that your final proposal is ready for evaluation.

Thank you.

Smart Cities Challenge Team
Infrastructure Canada
infc.sc-vi.infc@canada.ca

From: Wendy Gnenz [mailto:wendy.gnenz@edmonton.ca]
Sent: March 4, 2019 5:03 PM
To: SC / VI (INFC) <infc.sc-vi.infc@canada.ca>
Cc: Hwang, Susan (INFC) <susan.hwang@canada.ca>; Soumya Ghosh <soumya.ghosh@edmonton.ca>
Subject: City of Edmonton Smart Cities Challenge Finalist Submission (2 of 2)



It is with great enthusiasm that I submit the City of Edmonton's Smart Cities Challenge Finalist Package (email 2 of 2), which includes the following materials:

- 1 - Final Proposal (email 1 of 2)
- 2A - Finalist Video (email 1 of 2)
- 2B - Finalist Video Closed Captioning file (email 1 of 2)
- 3 - Preliminary Privacy Impact Assessment (email 2 of 2)**
- 5 - Accessibility Materials (email 2 of 2)**

Please note, we have not included 4 - Confidential Annex as all materials were included in the above files.

The following Preliminary Privacy Impact Assessment documents are included as attachments to this email:

- 3A - Edmonton's Smart Cities Challenge Preliminary Privacy Impact Assessment
- 3B - Comments from OIPC to Edmonton SCC PIA
- 3C - Edmonton's Smart Cities Challenge Response Letter to OIPC
- 3D - Appendix 1 - Access and Privacy System - February 28, 2019
- 3E - Appendix 2 - Healthy City Program and Privacy Considerations
- 3F - Appendix 3 - Open Data Procedure for Reviewing Data Sets

Also, included in this email is the Accessibility Materials to accompany our submission.

Our Finalist Submission demonstrates the City of Edmonton's capacity to create and nurture a resilient, livable, and workable city through technology, partnerships and social innovation.

We look forward to receiving questions from the Smart Cities Challenge Jury. Please acknowledge receipt of this email and access to all attachments.

Warm regards,



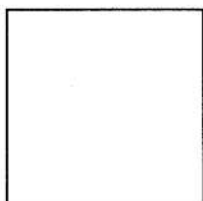
Wendy Gnenz, [REDACTED]

BRANCH MANAGER

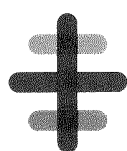
FINANCIAL AND CORPORATE SERVICES | OPEN CITY AND TECHNOLOGY

City of Edmonton
1400, Century Place
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Edmonton, AB T5J 3A3

[REDACTED]
Office
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Smart Cities Challenge Edmonton

FINAL PROPOSAL

March 2019

Edmonton

EXECUTIVE SUMMARY

INTRODUCTION

Modern municipalities operate in a period marked by a rapidly changing business environment, a call for more open and interactive government and an ever-increasing need to work collaboratively to address the complex challenges of today and tomorrow. As a world leader in leveraging data, technology and innovation, the City of Edmonton recognizes the need for an approach that is community-driven, evidence-based and delivered through partnerships in order to achieve sustainable solutions. This proposal highlights Edmonton's ability to lead the transformation of healthcare in Canada through the use of municipal-level interventions and a focus on building a stronger, more connected city, region and nation for all.

According to the World Health Organization, urban populations experience some of the world's most prominent health disparities. Residents are faced with increasing urban health hazards resulting from inadequate housing, transportation, food and environmental systems including air pollution, unhealthy diets, physical inactivity and isolation. Now, in the midst of the digital revolution that is transforming how individuals interact, communicate and connect, cities are also faced with understanding the technological challenges affecting the health of residents and how to lessen the impact of the digital divide.

Although technology is an integral part of building a smart and connected city, there are several non-technical components that work together to complete a Smart City ecosystem and become catalysts for innovation. These components range from the creation of public spaces where residents can come together to gain a sense of community belonging to the partnerships that will continue to drive the transformation of today's urban physical and digital environments. The City of Edmonton actively creates opportunities for diverse input and participation

by inviting residents to play a larger role in shaping their community to enable social and economic growth and impact environmental and health outcomes.

Smart Cities hold the promise to create healthier urban environments where residents can live their best lives. An open, inclusive and collaborative community is foundational to success. This means reducing socio-economic, physical and technical barriers, and creating accessible channels for delivery of effective programs and services. Edmonton's Open City Initiative strives to transform the City into a more transparent, open and accessible organization; one that is connected to the public and responsive to their vision for the future.

Edmonton proposes that municipal-level interventions guided by residents will have a significant impact on building healthier cities and will improve the quality of life for residents today and into the future. Edmonton's innovative Smart City approach to improve health through preventative measures addresses the true needs of the community through a collaboration between public and private sector organizations and residents. This approach,



HEALTHY CITY CHALLENGE STATEMENT

Edmonton will lead the **transformation of Canadian healthcare** using an unprecedented municipal approach by focusing on **leveraging relationships, health data and innovative technologies** to provide a personalized health connection and experience as **unique as the health of every Edmontonian.**

enabled by technology, analytics and data, will ensure Edmonton is a place where all residents have equitable opportunity for healthy, safe and joyful lives.

EDMONTON'S APPROACH

Edmonton's Smart Cities Challenge proposal encompasses the development and phased implementation of a Healthy City program. In this Healthy City program, municipal levers to improving the quality of life and well-being of residents are identified and changes to programs, policies and services will be implemented. Fundamental to the success of this program is partnering with residents, other levels of government, community organizations, educational institutions and businesses. The City of Edmonton will continue to evolve existing relationships with residents and partners, leveraging connected technology and data to understand the challenges in the community and create sustainable solutions that are scalable across Canada. Additionally, the City of Edmonton not only recognizes the importance of privacy to residents as technology advances and the use of big data increases, but also the importance of developing mitigating controls in partnership with residents as this field evolves.

By investing funds and resources in specific, purposeful steps that enable early adoption, measurement, refinement

and expansion of projects, the Healthy City program will transform the health of cities across Canada, starting with Edmonton. In collaboration with residents and partners, the program will lead projects to address the specific needs of diverse populations, evaluate with communities and then scale solutions appropriately.

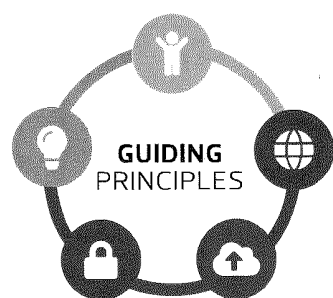
In addition, the City of Edmonton believes a collaborative partnership with the Government of Canada is a critical component in the success of Canada's urban digital transformation. Through focused efforts to share knowledge, ideas and learnings, Edmonton's Smart City approach will contribute to the advancement of objectives and outcomes at a national level. This will result in a greater benefit for all residents across Canada.

SMART CITY GUIDING PRINCIPLES

The principles listed in Figure A will guide the development and implementation of Edmonton's Healthy City program. These principles emphasize the City of Edmonton's commitment to building a healthier, more connected city with residents and partners, inciting innovation within the region and beyond.

These guiding principles are directly aligned with the foundational principles of the [City of Edmonton's Business Technology Strategy](#) – a City Council-approved strategy

FIGURE A: Smart City Guiding Principles



RESIDENT FOCUSED

Residents and community are the driving force behind transformative change in cities. City-building is rooted in the engagement and empowerment of residents.

PARTNERSHIPS

Multi-sector collaboration results in sustainable systems change. Collective impact is achieved through a shared vision for a vibrant and healthy community.

USEABLE INFORMATION

Decision-making is driven by relevant information that is inclusive. Information and data gaps and biases are acknowledged and steps are taken to ensure they are addressed.

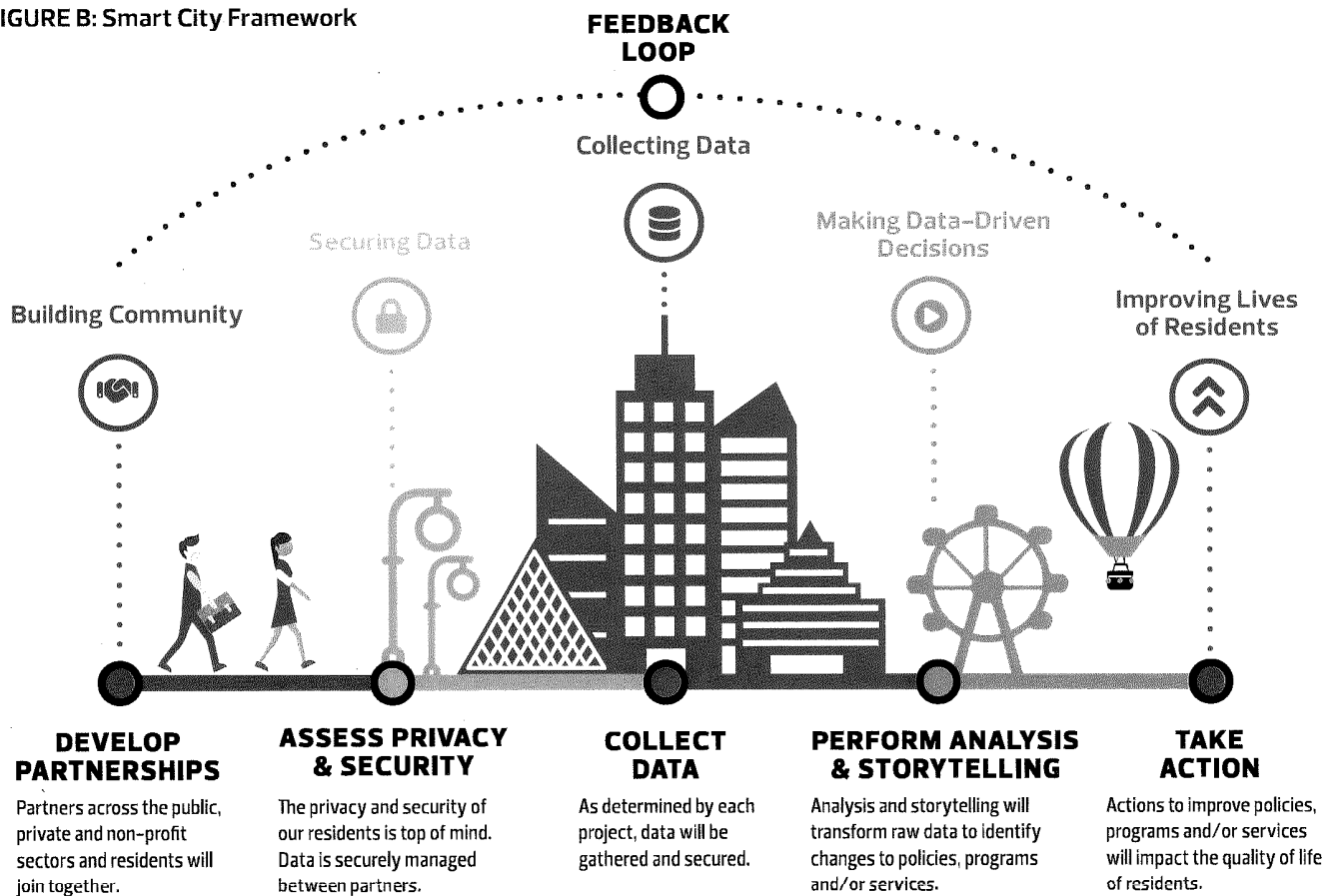
PRIVACY & SECURITY

Clear and transparent processes for gathering and using data and technology aligns with the highest privacy and security standards and the expectations of residents.

INNOVATION

Disruptive technology is embraced through a flexible and adaptable approach to doing business. Challenges transform into opportunities through an open and collaborative working environment.

FIGURE B: Smart City Framework



that enables a fully integrated approach to managing information, data and technology. The City has a significant amount of valuable data, business solutions and diverse technologies. To better leverage these assets, the application of the Business Technology Strategy increases internal and external data sharing, optimizes processes and delivers quality service while managing costs effectively—all in partnership with stakeholders and residents.

SMART CITY FRAMEWORK

Edmonton's Smart City Framework (Figure B) is a holistic approach to working collaboratively with residents and partners to optimize the use of data and technology, and influence the development of policies, programs, services and innovative funding models. Working with residents and partners, the City of Edmonton developed this approach to leveraging data, technology and innovation in order to provide an exceptional quality of life for residents. This framework is the foundation for Edmonton's phased approach to the building of a Healthy City program and ultimately healthier, more connected communities across the country.

TRANSFORMATION: EDMONTON'S PHASED APPROACH TO BUILDING SMARTER CITIES ACROSS CANADA

Edmonton's program methodology is broken down into three distinct phases: Initiate, Innovate and Embrace. The proposed approach demonstrates the City's commitment to investing funds and resources in the advancement of partnerships, processes and projects that will transform the municipal approach to solving complex problems across Canada.

Figure C demonstrates how the City of Edmonton plans to invest a total of \$60 million over three phases and the impact it will have over time. This \$60 million investment is a combination of \$50 million through Infrastructure Canada, \$5 million from the City of Edmonton and \$5 million through in-kind and other private or community investments. Through the creation of scalable and transferable tools and technology, Edmonton will provide opportunities for all municipalities to leverage this investment of funds and resources, resulting in the

transformation of how Canadian communities work with residents and partners to achieve excellence in data and technology.

CONNECTED CITIES FOR ALL RESIDENTS

Connected cities have vibrant public spaces, creative and diverse residents, opportunities for economic development and smart technologies. Connected cities have inclusive and innovative spirits that challenge the status quo and overcome barriers collaboratively. They are the cities that are transforming the regions they occupy and influencing community development at a national and global level. Edmonton is one of those cities and recognizes the importance connected communities play in building connected regions and ultimately a connected nation. In Edmonton, progress is linked to and driven by community for community. Connecting with others – across cultures, age groups, geography and communities of interest – is seen as essential for creating a vibrant, connected, engaged and healthy community for all.

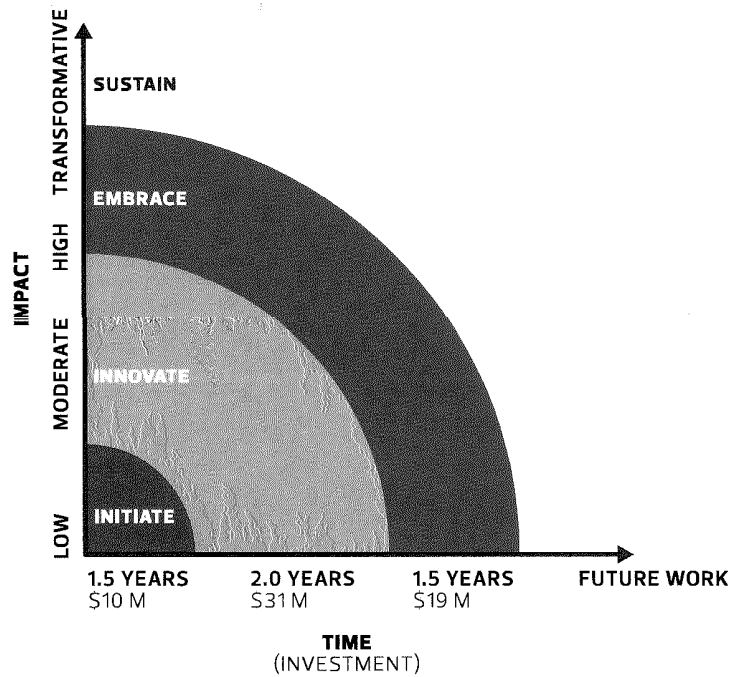
WHY EDMONTON?

Edmonton is Canada's Most Open City (Public Sector Digest, 2015, 2016 and 2017) and a Top 7 Intelligent Community (Intelligent Community Forum, 2017). It is a place where the community leverages data and connected technology to become more engaged with one another through social interactions such as volunteering, celebrating or just being together in the neighbourhood.

Edmonton is in an advantageous position to positively impact health outcomes for residents. The City has an outstanding network of academic, health, government and industry partners eager to work together on this initiative. Additionally, as a global leader in open data, open government, digital innovation and being a Smart City, Edmonton demonstrates an unwavering commitment to being a progressive and collaborative learning organization.

Edmonton was also recently named the best city in Canada for youth to work in 2019 from the YouthfulCities Urban Work Index. The index used an expansive, youth-driven definition for work that includes four thematic areas: education, entrepreneurship, affordability and employment. Creating vibrant, dynamic and open places for youth to work, live and play establishes a foundation for a Smart City to continue to grow.

FIGURE C: Phased Approach to Building Smarter Cities



The City of Edmonton has a world-class team with experience managing complex, multi-stakeholder and multi-dimensional projects in partnership with all levels of government, industry and residents. The City will continue to use proven mechanisms and processes to deliver project excellence and share learnings with the Government of Canada to help advance Smart City goals and priorities.

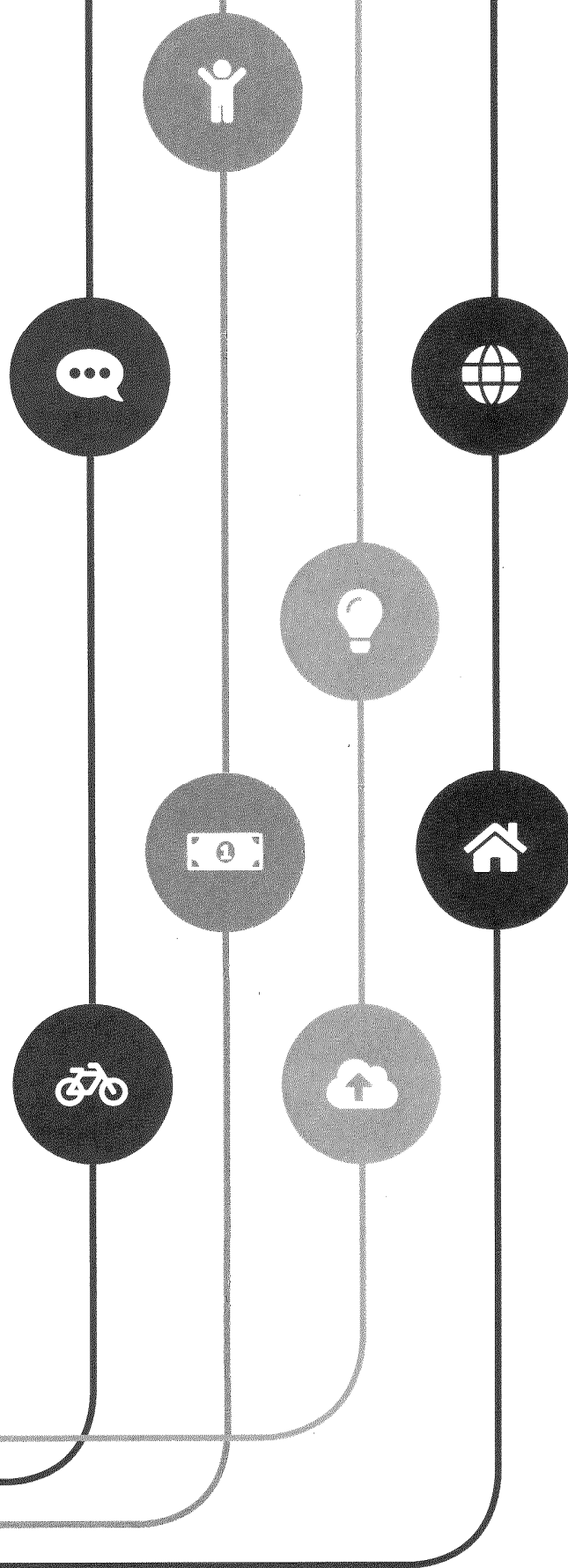
Connected cities have inclusive and innovative spirits that challenge the status quo and overcome barriers collaboratively.

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This document is the City of Edmonton's Final Proposal to Infrastructure Canada's Smart Cities Challenge. Thank you to all those who have contributed to the development of this proposal. Visit smartcities.edmonton.ca to learn more about the City of Edmonton's Smart Cities Challenge journey.

*As per the Smart Cities Challenge Finalist requirements, these sections are not included in the 75-page limit. The City of Edmonton's Final Proposal is a total of 75 pages.



1.0 VISION

1.1 EDMONTON'S SMART CITY STRATEGY

Edmonton is currently undergoing a resident-led digital transformation, championed by Mayor Don Iveson and City Council. To continue to provide value to residents, the City recognizes it must be a nimble organization – continuously evaluating and embracing the endless possibilities that accompany change.

As a result, the City created the Business Technology Strategy, the first of its kind in Canada, to guide the use of data, business solutions and diverse technologies to improve life in Edmonton. As a digital city, Edmonton is embracing new ways of delivering programs and services to address the challenges of the day with residents at the core.

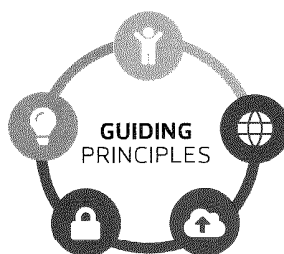
Complementing the Business Technology Strategy is Edmonton's Smart City Strategy – an innovation ecosystem of government, academia, residents and industry, that follows the International Organization for Standardization Standard 37106 (2018). It is not just about the administration of municipal programs and services; it is about Edmonton as a thriving community. Edmonton is a creative community of changemakers and social innovators – where residents are engaged with their community and lead the charge for a better future. The City of Edmonton addresses today's challenges and creates tomorrow's opportunities through collaboration and innovation.

1.1.1 GUIDING PRINCIPLES

The principles shown in Figure 1 were used by the City of Edmonton to guide the development of Edmonton's Smart Cities Challenge proposal and demonstrate the organization's commitment to working collaboratively to achieve innovation. These principles will continue to guide the development and implementation of Edmonton's Healthy City program and Edmonton's other Smart City initiatives to ensure an integrated, collaborative, open and scalable approach.

As cities and communities eagerly search for new ways to address complex challenges, there is a growing recognition that solutions require multi-sector efforts and organizational agility in order to be meaningful and transformative. These guiding principles are critical success factors for Edmonton to continue to progress as a Smart

FIGURE 1: Smart City Guiding Principles



RESIDENT FOCUSED

Residents and community are the driving force behind transformative change in cities. City-building is rooted in the engagement and empowerment of residents.

PARTNERSHIPS

Multi-sector collaboration results in sustainable systems change. Collective impact is achieved through a shared vision for a vibrant and healthy community.

USABLE INFORMATION

Decision-making is driven by relevant information that is inclusive. Information and data gaps and biases are acknowledged and steps are taken to ensure they are addressed.

PRIVACY & SECURITY

Clear and transparent processes for gathering and using data and technology aligns with the highest privacy and security standards and the expectations of residents.

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Disruptive technology is embraced through a flexible and adaptable approach to doing business. Challenges transform into opportunities through an open and collaborative working environment.

HEALTHY CITY CHALLENGE STATEMENT

Edmonton will lead the **transformation of Canadian healthcare** using an unprecedented municipal approach by focusing on **leveraging relationships, health data and innovative technologies** to provide a personalized health connection and experience as **unique as the health of every Edmontonian.**

City leader. Together, with the Business Technology Strategy and Edmonton's Smart City Strategy, these principles form the foundation for Edmonton's success in achieving transferable and scalable Smart City outcomes.

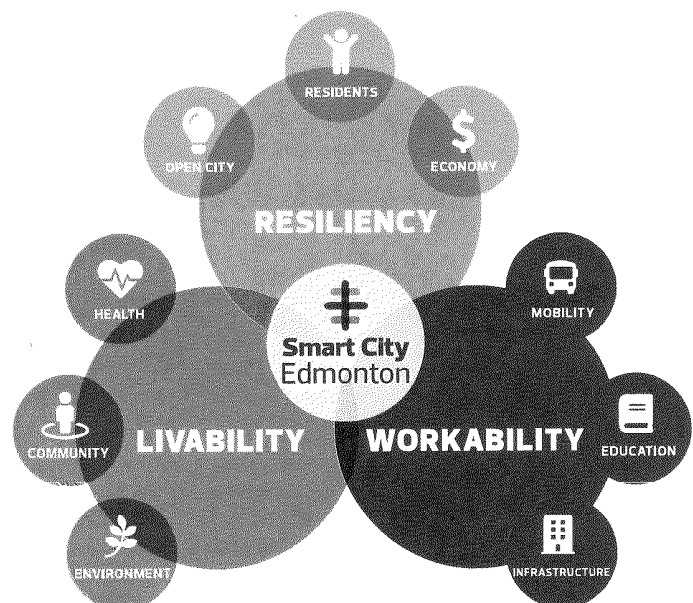
1.2 WHY HEALTH? A SMART CITY IS A HEALTHY CITY

A city of the future – a Smart City – is a Healthy City. It is one where residents, industries, academic sectors and government work collaboratively to learn about the challenges the city is facing, and create, test and scale sustainable solutions. A Smart City identifies the transformational shifts required to boldly challenge the status quo and build an inclusive and digitally enabled community. Together with residents and partners, a Smart City creates and nurtures a resilient, livable and workable community that rises to the challenges being faced today, enhances the vibrancy and diversity of the city, and embraces the opportunities of tomorrow. This concept is shown in Figure 2.

Cities are in the unique position of working directly with residents and the local built environment to use technology and innovation to revolutionize the urban setting and improve the health of residents. A city of the future – a Smart, Healthy City – recognizes this incredible opportunity to identify and intentionally advance transformative priorities with residents, not for them.

The 2016 Conference Board of Canada City Health Monitor ranked Edmonton eighth place out of ten in physical and socio-economic health among larger Canadian municipalities. A Smart City approach to improve the health of Edmontonians is indeed a priority. This approach is both aspirational and innovative. It has the potential to make Edmonton one of the healthiest cities in Canada. Through established mechanisms and community partners, the City is uniquely positioned to understand the health of its residents and quickly test interventions at the neighbourhood level, measuring outcomes and reporting results to inform decision-making in order to scale solutions effectively.

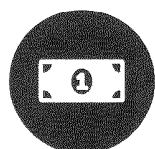
FIGURE 2: Smart Cities are Livable, Workable and Resilient



1.2.1 HEALTH DEFINED

The City of Edmonton is committed to improving the economic, mental, physical and social health and well-being of all residents and developing policies, programs and services that will benefit residents. Edmonton is addressing the following four facets of health as per the descriptions in Figure 3.

FIGURE 3: The Four Facets of Health



ECONOMIC HEALTH

Poor health can negatively affect both labour force participation and productivity. For individuals, it can result in reduced income or unemployment; for businesses, it may mean productivity losses, and labour and skills shortages.

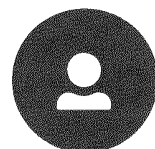
Conference Board of Canada



PHYSICAL HEALTH

Physically active lifestyles have been linked to better overall health, better self-esteem, stronger muscles and bones, relaxation and reduced stress, continued independence in life, lower risk of chronic disease and improved sleeping habits.

Alberta Health



MENTAL HEALTH

Mental health includes emotional, psychological and social well-being. It affects how individuals think, feel and act.

MentalHealth.gov



SOCIAL HEALTH

The social determinants of health influence the health of populations. They include social status, social support networks, education, employment conditions, social environments, physical environments, personal health practices and coping skills, gender and culture.

Government of Canada

Municipalities play a vital role in contributing to the health of their residents. The City of Edmonton's proactive approach proposes to improve the health of residents by addressing the root causes of health issues. With the recognition that preventive health services need to be responsive to the unique needs of all residents, the City has created an approach that is resident-driven, evidence-based and will be delivered in partnership with the community. From a municipal perspective, addressing social determinants of health such as isolation and access to services in this collaborative setting is an innovative, transformational approach to achieving preventive health outcomes.

1.2.2 ALIGNMENT TO CITY OF EDMONTON PRIORITIES AND INITIATIVES

Edmonton City Council's Strategic Plan was renewed in 2018 with a focus on four goals shown in Figure 4.

FIGURE 4: Edmonton City Council's Strategic Plan



Edmonton is a neighbourly city with community and personal wellness that embodies and promotes equity for all Edmontonians.



Edmonton neighbourhoods are more vibrant as density increases, where people and businesses thrive and where housing and mobility options are plentiful.



Edmonton grows prosperity for our Metro Region by driving innovation, competitiveness and relevance for our businesses at the local and global level.



Edmonton is a city transitioning to a low-carbon future, has clean air and water and is adapting to a changing climate.

While Edmonton's Smart Cities Challenge proposal supports all four goals, it focuses primarily on contributing to the Healthy City goal.

A selection of City of Edmonton initiatives that contribute to a Healthy City are shown in Figure 5. These initiatives demonstrate the City's commitment to working collaboratively with community and residents to create a healthier city for all, and showcase how the City of Edmonton continuously supports an inclusive, healthy and connected community.

Cities are in the unique position of working directly with residents and the local built environment to use technology and innovation to revolutionize the urban setting and improve the health of residents.

FIGURE 5: City of Edmonton Initiatives



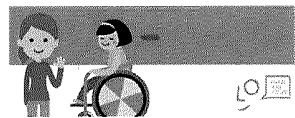
HEALTH CITY

Health City is an economic development initiative created to catalyze the health innovation ecosystem in Edmonton. Their focus is on transforming innovations into solutions that have commercial application and global relevance – adopting them for impact in Edmonton and scaling them for export to global markets.



RECOVER

An initiative developed to define and improve urban wellness. It focuses on finding ways to better align and collaborate across different orders of government, social agencies, local businesses and the community.



URBAN ISOLATION & MENTAL HEALTH INITIATIVE

The City of Edmonton's initiative on Urban Isolation and Mental Health is working to positively affect mental health and well-being by connecting residents within their communities.



AGE FRIENDLY EDMONTON

Age Friendly Edmonton addresses the key factors that contribute to healthy, active, creative aging in Edmonton. It is an initiative to build a city that values, respects and actively supports the well-being of seniors.



CHILD FRIENDLY EDMONTON

Child Friendly Edmonton, in a spirit of cooperation and collaboration, works with residents, community groups and levels of government to create the best possible results for children and their families. The Child Friendly Edmonton Initiative is based on the International UNICEF Child Friendly Cities Initiative.



LIVE ACTIVE STRATEGY

This strategy provides a road map for supporting the active recreational and sporting needs of all Edmontonians. It raises awareness and encourages Edmontonians to become more physically active, whether that be in sports activities, recreational activities or active living pursuits.

1.2.3 SUPPORTING RESEARCH

The following is a summary of the research that provides additional context for the municipal focus on advancing the health of residents.

- The [United Nations](#) reports that today, 54 per cent of the world's population lives in urban areas, a proportion that is expected to increase to 66 per cent by 2050. (World's Population Increasingly Urban with More than Half Living in Urban Areas, 2014)
- The [World Health Organization](#) reports chronic diseases are the major cause of death and disability worldwide. In Canada, chronic diseases are projected to account for 89 per cent of all deaths. (Chronic Diseases and their Common Risk Factors, 2005)
- The [Canadian Institute for Health Information](#) reports that while the healthcare system can prolong survival and cure people of diseases, the improvement of population health depends largely on public health policies and on broader governmental action. (A Performance Measurement Framework for the Canadian Health System, 2013)
- "Evidence increasingly demonstrates that many aspects of city and neighbourhood form, urban and transport design, and residential environments play an important role in mediating health and health equity outcomes." (Cities and Health: An Evolving Global Conversation, 2017)
- "Many would be surprised to learn that the greatest contribution to the health of the nation over the past 150 years was made, not by doctors or hospitals, but by local governments. Our lack of appreciation of the role of our cities in establishing the health of the nation is largely due to the fact that so little has been written about it." (Healthy Cities and Communities: Past, Present and Future, 1997)
- "A Smart City for health and well-being is one that takes an integrated approach to the use of digital technologies to increase the connectedness of people to the information and city functions that improve health and well-being, reduce inequalities and support a higher quality of life for all its residents." (Cities as Places of Well-Being, 2015)

Additional research was completed into how other Smart Cities around the world are improving the health and well-being of residents. Two examples from this research are: City4Age and the Societal Engagement Toolkit.

- [City4Age](#): Elderly-friendly City services for active and healthy aging.
 - "City4Age will activate urban communities to facilitate the role of social/health services and of families in dealing with mild cognitive impairments and frailty in the elderly population. The challenge is to demonstrate that Cities play a pivotal role in the unobtrusive collection of 'more data' on individual behaviours, and with 'increased frequency'. This can then greatly improve the early detection of risks through the timely analysis of changes in these behaviours and, finally, the design of effective interventions for countering these risks." (City4Age EU Project, 2019)
- [SET: The toolkit to engage citizens in co-creating their cities](#).
 - "In order for cities to co-create the urban spaces of the future together with the people that live in them, a Societal Engagement Toolkit (SET) is being created to help local authorities bridge the gap between them and their citizens. Our cities today face challenges on an unprecedented scale from providing healthcare for an aging population, reducing crime rates and boosting employment to improving air quality, transforming transport to be more sustainable and (re-)building energy efficient housing. Cities cannot work in isolation to find solutions to such challenges. Cooperation with businesses, academics and public authorities is important to stimulate and steer change; however, involving the citizens who live and work in those cities is vital. A new and better future can only be delivered when citizens take personal and collective responsibility for how they 'use' their city, changing their mindset, behaviours and actions." (SET – The Toolkit to Engage Citizens in Co-Creating their Cities, 2018)

This research demonstrates the important role cities have in using partnerships, data and connected technologies to improve the health and well-being of residents. The results of the City of Edmonton's public engagement and consultation with stakeholders and partners further validated this focus (see Chapter 6).

1.3 HEALTHY CITY OUTCOMES

1.3.1 FINAL OUTCOMES

The primary outcomes to be achieved as a result of implementing the City of Edmonton's Healthy City program are shown in Figure 6.

FIGURE 6: Healthy City Outcomes



1. To improve quality of life for residents.

The City of Edmonton and partners will implement changes to policies, programs and services to positively impact the health and well-being of residents.



2. To transform how municipalities across Canada work with residents and partners to achieve excellence in data and technology.

The City of Edmonton will lead the creation of a municipal-focused digital innovation collective that spans communities across Canada in order to build capacity for resident-driven open data and analytics. This would also extend to First Nations, Métis and Inuit communities.

2. **Establish an Information Sharing Framework** – The City of Edmonton is developing an actionable framework that will facilitate the sharing of anonymized data and information across the Healthy City Ecosystem in order to understand the current state of data existence and completeness. This framework will be developed in conjunction with residents, community members and partners and will focus on understanding how data and information can be used to help identify and solve problems. Alberta's Office of the Information and Privacy Commissioner will play an integral role in the development and implementation of the Information Sharing Framework to ensure all current and potential privacy and security considerations are addressed.

3. **Lead Projects to Improve Health and Well-Being of Residents** – The City will lead projects that positively impact the health and well-being of residents. The City envisions a community that thrives and is united, not divided, by data, information and digital technologies. Edmonton is a city for all, connected and healthy. When health programs are delivered to their maximum benefit, every Edmontonian and the city as a whole thrives.

4. **Establish a Municipal-Focused Digital Innovation Collective** – The City of Edmonton will lead the development of a municipal collective for digital innovation across Canada in order to transform the use of data and connected technology for more effective decision-making. It will also work towards reducing data poverty across Canadian municipalities. This transformative approach will ensure replicability and scalability of processes and solutions across Canada.

In order to achieve these actions, the City will work with partners to break down traditional barriers to improving the development and delivery of policies, programs and services in Edmonton, a model that can be applied to all Canadian municipalities. Chapter 3 explains in detail how these actions form the basis for the Healthy City Program Management Plan.

Utilizing an extensive body of national and global subject matter experts, academic research and thought leaders as well as ongoing, focused engagement with residents and stakeholders, the City's high level approach to achieving the above outcomes is outlined below:

1. **Advance the Healthy City Ecosystem** – The City of Edmonton will advance the development of the Healthy City Ecosystem to work collaboratively to provide integrated community-based preventative health support. The Healthy City Ecosystem comprises public sector organizations, private sector organizations, academic institutions and residents. The ecosystem works collaboratively to improve the capacity of all partners while developing efficient and effective ways to provide meaningful services to residents. The growth of the ecosystem will continue by identifying partnerships, opportunities for innovation and the means by which to improve the efficacy of preventative health services.

1.3.2 EVOLUTION OF OUTCOMES

The final outcomes of the Healthy City program vary from those identified in Edmonton's initial application. This evolution of outcomes was the result of additional engagement, practicality of implementation, transferability, access to supporting data, and privacy and security considerations. It was acknowledged through additional research and community consultation that the original outcomes were too prescriptive to allow for continuous learning and adaptation of the Healthy City program. These final outcomes reinforce Edmonton's agile approach to building a healthier, more connected city.

1.3.3 OUTCOME RATIONALE AND SUPPORT FROM COMMUNITY



Outcome 1: To improve quality of life for residents.

The City of Edmonton consulted with numerous residents and stakeholders in the Healthy City Ecosystem to solidify this outcome. The consensus was that Edmontonians want to transform how programs and services are delivered, in addition to becoming healthier and more engaged in their communities. They desire to create a sense of compassion, inclusiveness and connectedness that empowers them to support each other. The results of the City's engagement activities validated the importance that residents place on quality of life, as opposed to other initiatives including economic development and smart mobility.



Outcome 2: To transform how municipalities across Canada work with residents to achieve excellence in data and technology.

Through consultation with stakeholders in the Healthy City Ecosystem, the City of Edmonton developed an ambitious, yet achievable, second outcome. The City of Edmonton, through support from City Council and the Executive Leadership Team, continues to be a leader in the use of data, technology and innovation to achieve meaningful results for residents. The City receives ongoing requests to speak at national and international conferences and share learnings, processes and tools with other communities. Through this outcome, a formal program for the continuous sharing and advancement of ideas and capacities will be established.

Evaluating Outcomes

A comprehensive evaluation framework has been developed to make certain these outcomes, while aspirational, are measurable and achievable. This detailed framework is provided in Chapter 2 and includes a number of performance indicators.

1.3.4 PROGRESS TO DATE ON OUTCOMES

Tables 1 and 2 showcase the progress Edmonton has made to date during the final submission period on achieving the two program outcomes.



Outcome 1: To improve quality of life for residents.

The City of Edmonton and partners will implement changes to policies, programs and services to positively impact the health and well-being of residents.

TABLE 1: Progress to Date on Improving Quality of Life for Residents

PROJECT OR INITIATIVE	DELIVERABLES
HealthHack Competition – March 2018	The HealthHack competition brought together the civic tech community to build solutions for a healthier city. Five finalists were selected on March 16, 2018 and their ideas included a buddy bench extension program, a cannabis ecosystem, a fitness app for non-athletes, an urban design and mental health app, and a wheelchair accessibility tracker.
Grow with Google – September 2018	Grow with Google is a series of community events that help Canadians develop the skills they need to prepare for a job, find a job or grow their business. In this collaboration with the City of Edmonton, Google provided training to local educators, business owners, aspiring technology professionals and entrepreneurs. Over 400 individuals were able to build community partnerships, learn valuable digital skills and enhance their career potential through this initiative.
HackED – January 2019	The City of Edmonton sponsored this student-led Faculty of Engineering initiative at the University of Alberta. Through this sponsorship and engagement at the event, the City of Edmonton raised awareness to 450 attendees for open data and Smart City initiatives. Participants in the hackathon created teams to design and build smart, innovative projects to solve problems important to the community. It is an excellent opportunity for learning through collaboration that leads to positive sociological and psychological outcomes.
You Can Benefit – Ongoing	The You Can Benefit online tool helps residents in Edmonton easily access information on municipal, provincial and federal benefits. You Can Benefit provides Edmontonians access to more than 28 programs and 120 community services in one place, such as the City of Edmonton Leisure Access Program and Ride Transit Program, the Alberta Child Care Subsidy and the Alberta Seniors Benefit. Several iterations have been introduced to provide better reliability and results.
RECOVER – Ongoing	RECOVER is a community wellness program developed for the City's most vulnerable populations. Using a phased approach, the program aims to develop a new, fully integrated approach across a continuum of pre-crisis, crisis intervention, post-crisis and transitional services.



Outcome 2: To transform how municipalities across Canada work with residents to achieve excellence in data and technology.

The City of Edmonton will lead the creation of a municipal-focused digital innovation collective that spans communities across Canada in order to build capacity for resident-driven open data and analytics. This would also extend to First Nations, Métis and Inuit communities.

TABLE 2: Progress to Date on Transforming how Municipalities across Canada work with Residents to achieve Excellence in Data and Technology

PROJECT OR INITIATIVE	DELIVERABLE
Open Data Citizen Advisory Group – March 2018	The City, in partnership with the Open Data Citizen Advisory Group, shared insights and feedback on the functionality of the Open Data Portal. The group provided feedback on the look and feel of the tool and file structure allowing the City to make user-centric improvements.
Canadian Open Data Summit 2018 – Wendy Gnenz, Canadian Open Data Leader Award – November 2018	The Canadian Open Data Summit jury recognized Edmonton's successes and leadership in the Open Data movement in Canada under the strategic leadership of the City's Chief Information Officer, Wendy Gnenz. Wendy was the driving force behind advancing the Open City Policy, adopting the International Open Data Charter, and winning Most Open City in the Open Cities Index three years in a row.
City Park Usage – Pedestrian Counter – Ongoing	Through the Smart Cities program, a prototype was developed for a park pedestrian counter. The prototype uses thermal sensing and image recognition to understand how parks or attractions are utilized. The sensors use a wireless data sharing network to transfer data. The pedestrian counter has gone through a variety of iterations to improve accuracy and the code was shared through an open source platform with municipalities globally.
Open Science Partnership with University of Alberta – Ongoing	The City of Edmonton works with researchers at post-secondary institutions to actively promote open data for research purposes. Edmonton's Open Data Portal is regularly referenced as a source in academic publications. As an example, a University of Alberta professor in Earth and Atmospheric Sciences directed an entire class of graduate students to perform geospatial analysis using Edmonton's open data. The students' final work was presented at City Hall with viewers from City Planning Committees, City employees and the public. The students contributed diverse research and analysis as well as requests for new datasets to be included in the Open Data Portal.
MetroLab Network Partnership with the University of Alberta – Ongoing	The MetroLab Network between municipalities and universities focuses on bringing data, analytics and innovation to local government. These institutions partner together to tackle problems and share solutions and best practices for economic development, resiliency, social equity, transportation and governance. This initiative aims to positively impact Edmontonians and strengthen the reputation of the City as a partner in innovative city-building. Edmonton is the first participating Canadian municipality in the MetroLab Network.
Developing Shareable Solutions – Ongoing	The City of Edmonton continuously works with partners in developing technology solutions to improve the lives of residents. These solutions are shareable with communities and can be applied utilizing local partnerships and data. Solutions include the Optimized Safe Needle Response and Emergency Operations Demand Dashboard. These projects are explained in further detail in Chapter 4 (see 4.1.2 Shareable Solutions).

1.4 WHY EDMONTON?

The City of Edmonton is a world leader in leveraging data, technology and innovation to improve quality of life for residents. In addition to being named Canada's Most Open City and a Top 7 Intelligent Community of the Year, Edmonton is the most recent winner of the Gold WeGo Smart Sustainable City Award, the first Canadian city to win the IBM Smarter Cities Challenge award, and the first Canadian pilot of Johns Hopkins University's Centre for Government Excellence [What Works Cities](#) initiative.

The following achievements and initiatives demonstrate the City of Edmonton's readiness to work in partnership with community to continue to lead as a Smart City:

- ✓ The City has led the country in understanding the value of combining open data, public engagement and analytics. The [Open City Initiative](#) is a complex program of work streams and projects spanning all 30+ internal business areas and extending to external organizations through outreach and partnerships. The accomplishments of this initiative are internationally recognized.
- ✓ With the development and implementation of Canada's first measurable Open Data Strategy, Edmonton has shown its commitment to transparency and openness. [Edmonton's Open Data Portal](#) was launched in 2010 and has grown to over 2,000 assets with more than 50 million annual transactions. Edmonton's City Council was also the first in the United States and Canada to adopt the [International Open Data Charter](#). This adoption again demonstrates the unprecedented commitment to accessibility and transparency by City of Edmonton leaders.
- ✓ The City of Edmonton's Analytics Center of Excellence (ACE) is world-renowned for delivering complex and multi-disciplinary projects. ACE has completed projects of global significance, including a contextual analysis of crime, development of a human trafficking identification tool, and an optimization model for snow plowing routes. The optimization and analytics models developed through these projects are made available to other municipalities under the Creative Commons license and open-source code.

- ✓ [Health City](#) is a unique, Edmonton-built initiative that represents a hub of expertise in health and the health industry. It supports broad innovation ecosystem development and is working to transform health to meet the evolving needs of residents.

The City of Edmonton continues to deliver complex, multi-stakeholder and multi-dimensional projects in partnership with all levels of government, industry and residents. Through the Healthy City program, the City will continue to use these proven mechanisms and processes to deliver project excellence and share learnings with the Government of Canada to help advance Smart City goals and priorities.

2.0 PERFORMANCE MEASUREMENT

Outcomes-based performance measurement in government organizations provides a strong evidence base for service improvement and transformation. It facilitates effective decision-making, risk mitigation and the efficient use of resources. Strong performance management contributes to the growth and sustainability of an organization by continuously identifying areas for intervention and action, leading to the achievement of outcomes.

The City of Edmonton is an outcomes-based organization with a defined framework that links strategic planning, risk management and performance management processes together to ensure progress is made towards resident-driven outcomes. The City also has experience in successfully managing outcomes-based funding agreements, including the current agreement with Infrastructure Canada on the Yellowhead Trail Freeway Conversion project. As such, the City has incorporated learnings and best practices from these experiences into the development of a comprehensive Performance Measurement Plan for the Healthy City program.

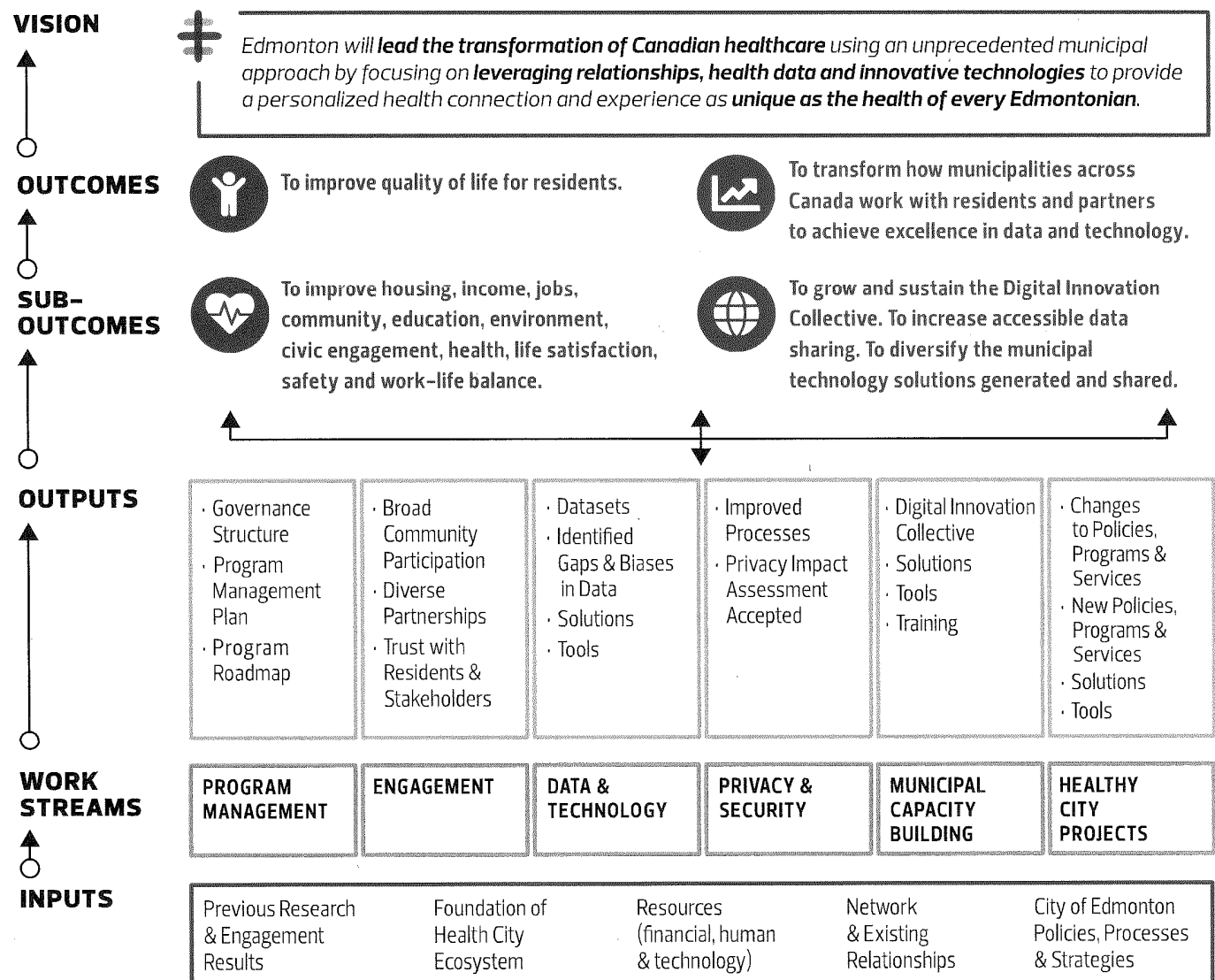
2.1 HEALTHY CITY PROGRAM LOGIC MODEL

The City of Edmonton defines a logic model as a tool used by an organization to align work activities with desired outputs and outcomes. A sound and robust logic model effectively aligns program outcomes with program outputs, work streams and inputs. The following additional definitions provide context for terms used in the logic model and throughout this chapter:

1. **Outcome:** Specific changes in individuals or conditions as a result of the completion of work streams and activities.
2. **Sub-Outcome:** One component of the overall outcome; achievement of numerous sub-outcomes are required to achieve the higher-level outcome.
3. **Output:** What is produced as a result of activities delivered through work streams.
4. **Work Streams:** Groupings of individual activities against which progress can be measured to ensure sub-outcomes and outcomes are achieved.
5. **Input:** The resources utilized in order to achieve an output. This includes financial, human and technology resources.
6. **Performance Indicator:** Evidence that progress has been made towards sub-outcomes and outcomes. Performance indicators will be assigned to one of three categories:
 - **Relevance:** The relationship between a program's outcomes and the current priorities of residents and partners. A relevant program helps address the City's priorities and advances the essential needs and wants of the community.
 - **Effectiveness:** The relationship between outputs and outcomes. Effectiveness is concerned with ensuring the program's outputs are resulting in the intended outcomes that will ultimately contribute to the achievement of the long-term vision and priorities of residents.
 - **Efficiency:** The relationship between inputs and outputs. Efficiency is concerned with the resources used to produce the outputs as well as the quality and timeliness of the outputs. An efficient service produces the maximum outputs possible that meet specified quality and timeliness with the least amount of resources.
7. **Community Indicator:** The state or condition of something, generally at a community level, which is impacted by a composite of programs, partnerships and external factors.

The Healthy City logic model (Figure 7) demonstrates the links between program outcomes and sub-outcomes as well as program outputs, work streams and inputs.

FIGURE 7: Healthy City Program Logic Model



2.2 ALIGNMENT BETWEEN OUTCOMES AND SUB-OUTCOMES

The purpose of the Healthy City program is to deliver on the following two outcomes:

FIGURE 6: Healthy City Outcomes (previously shown in Chapter 1)

- 1. To improve quality of life for residents.**

The City of Edmonton and partners will implement changes to policies, programs and services to positively impact the health and well-being of residents.
- 2. To transform how municipalities across Canada work with residents and partners to achieve excellence in data and technology.**

The City of Edmonton will lead the creation of a municipal-focused digital innovation collective that spans communities across Canada in order to build capacity for resident-driven open data and analytics. This would also extend to First Nations, Métis and Inuit communities.

As there is no single metric for measuring municipal resident quality of life or transforming municipalities, a multifaceted approach to measuring program success is required. The outcomes will be realized through achievement of a series of sub-outcomes as described below.

2.2.1 SUB-OUTCOMES FOR IMPROVING THE QUALITY OF LIFE FOR RESIDENTS

The [Organization for Economic Cooperation and Development \(OECD\) Better Life Index](#) has identified 11 factors essential to well-being because of how they impact quality of life. These factors consist of the following:

- **Housing:** Satisfactory and affordable housing conditions.
- **Income:** Adequate resources to satisfy basic needs and achieve well-being.
- **Jobs:** Alignment of employment with aspirations and competencies allow for financial stability.
- **Community:** Frequency of contact and quality of social support network.

- **Education:** Knowledge, skills and competencies exist to participate effectively in society and the economy.
- **Environment:** Quality of local living environment.
- **Civic Engagement:** Trust in open and transparent government processes.
- **Health:** Living standards, environmental improvements, lifestyle changes and education impact life expectancy and well-being.
- **Life Satisfaction:** Personal evaluation of health, education, income, personal fulfilment and social conditions.
- **Safety:** Sense of personal security.
- **Work-Life Balance:** Suitable balance between work and daily living.

In alignment with this research, the City of Edmonton has chosen the sub-outcome measures shown in Table 3 for their relevance in assessing the achievement of improved quality of life and the existence of current baseline data.

TABLE 3: Sub-Outcome Measures for Quality of Life

#	SUB-OUTCOME MEASURE	METHODOLOGY/SOURCE	YEAR	RESULT/ BASELINE
1	Measures the percentage of respondents indicating they feel connected to their community.	Citizen Perception (Leger Research, 400 sample size)	2017	45%
2	Measures the percentage of seniors (55+) indicating they feel lonely at least once per week.	Age Friendly Edmonton (Pivotal Research, 713 sample size)	2018	12%
3	Measures the percentage of respondents indicating that "being a member of this community (neighbourhood) is part of my identity".	Sense of Community (Insight Community, 972 sample size)	2018	15%
4	Measures the percentage of respondents indicating that "I am with other community members a lot and enjoy being with them".	Sense of Community (Insight Community, 972 sample size)	2018	14%
5	Measures the percentage of respondents reporting that, overall, Edmonton is a safe city.	Citizen Perception (Leger Research, 400 sample size)	2017	66%

Additional sub-outcomes may be identified during the Health City program delivery as individual projects are defined and implemented.

2.2.2 SUB-OUTCOMES FOR TRANSFORMING HOW CANADIAN MUNICIPALITIES ACHIEVE EXCELLENCE IN DATA AND TECHNOLOGY

The City of Edmonton has been a leader in the open government movement in Canada for many years. As a leader, Edmonton has and will continue to develop practices not only to assist other municipalities with understanding the importance of open government, but also create practical tools and technologies for them to become more transparent, inclusive and collaborative.

The City recognizes the significant data poverty issue that exists within Canadian municipalities. The Healthy City program envisions a future state where municipalities

in Canada, big or small, urban or rural, will have the opportunity to overcome this challenge and build capacity to be effective in making data-driven decisions.

Edmonton has developed Open Data in a Box to help municipalities embark on their own open data program. Open source code developed from local intelligence and analytics projects is readily shared around the globe. Edmonton has also facilitated numerous Canadian and global conversations regarding data, technology transformation and the importance of Smart City philosophies.

Achievement toward this outcome will be measured through the sub-outcome measures in Table 4.

TABLE 4: Sub-Outcome Measures for Transforming how Canadian Municipalities Achieve Excellence in Data and Technology

#	SUB-OUTCOME MEASURE	METHODOLOGY/SOURCE	YEAR	RESULT/ BASELINE
1	Per cent of Canadian municipalities with an open data committee	Open Cities Index	2018	45%
2	Per cent of Canadian municipalities with an open data policy	Open Cities Index	2018	45%
3	Number of municipalities with a dedicated Smart City program or office	Survey	2019	To be established
4	Number of open source projects released by municipalities on GitHub	Survey	2019	To be established

As the Healthy City program moves through the phases of program implementation (see 3.1 Program Delivery Approach), additional sub-outcomes may be added.

As a leader, Edmonton has and will continue to develop practices not only to assist other municipalities with understanding the importance of open government, but also to create practical tools and technologies for them to become more transparent, inclusive and collaborative.

2.3 MEASURING PERFORMANCE OF THE HEALTHY CITY PROGRAM

The alignment between the Healthy City program work streams, outputs and performance indicators is shown in Table 5. Performance indicators have been identified to demonstrate short-, mid- and long-term progress. These will be reported on throughout each phase of the program.

TABLE 5: Healthy City Program Performance Indicators

WORK STREAM	OUTPUT	PERFORMANCE INDICATORS	TYPE OF PERFORMANCE INDICATOR	SOURCE
Program Management	Governance Structure	Active participation from all individuals and groups within the governance structure	Effectiveness	Annual self-evaluation from program participants
	Program Management Plan	Program Management Plan is robust and addresses program risks	Relevance	Healthy City Program Governance Review Processes
	Program Roadmap	Program Roadmap is agile and flexible	Relevance	Healthy City Program Governance Review Processes
Engagement	Broad Community Participation	Residents from diverse demographics and communities participate actively in Healthy City Program engagement activities	Relevance	Post-engagement session questionnaire Consistent demographic specific questions will be present on every survey
	Build Trust with Residents and Stakeholders	Residents and stakeholders have trust in the Healthy City Program	Effectiveness	Annual Healthy City Program Survey
	Diverse Partnerships	Healthy City Ecosystem partners represent multiple sectors and diverse demographics	Effectiveness	Healthy City Program and Project Partnership Evaluation Survey
Data & Technology	Datasets	Number of datasets shared between Healthy City Ecosystem partners	Efficiency	Healthy City Program Quarterly Report
	Identifying Gaps and Biases in Data	Number of gaps and biases in data identified	Effectiveness	Healthy City Program Quarterly Report
	Solutions	Number of data and technology solutions implemented	Efficiency	Healthy City Program Quarterly Report
	Tools	Number of data and technology tools implemented	Efficiency	Healthy City Program Quarterly Report

TABLE 5: Healthy City Program Performance Indicators (continued)

WORK STREAM	OUTPUT	PERFORMANCE INDICATORS	TYPE OF PERFORMANCE INDICATOR	SOURCE
Privacy & Security	Improved Privacy and Security Processes	Enhancement of Privacy and Security processes	Effectiveness	Healthy City Program Management Office
	Privacy Impact Assessments accepted from Office of the Information and Privacy Commissioner of Alberta	Number of Privacy Impact Assessments accepted from Office of the Information and Privacy Commissioner of Alberta	Effectiveness	Healthy City Program Quarterly Report
Municipal Capacity Building	Digital Innovation Collective	Number of municipalities participating in the Digital Innovation Collective	Relevance	Digital Innovation Collective Terms of Reference
	Solutions	Number of transferable solutions generated through the Digital Innovation Collective	Efficiency	Digital Innovation Collective Annual Report
	Tools	Number of transferable tools generated through the Digital Innovation Collective	Efficiency	Digital Innovation Collective Annual Report
	Training	Number of training sessions hosted	Efficiency	Digital Innovation Collective Annual Report
		Number of average participants in training sessions	Efficiency	Digital Innovation Collective Annual Report
		Number of training guides created	Efficiency	Digital Innovation Collective Annual Report
Healthy City Projects	Changes to Policies, Programs and/or Services are Implemented	Number of policies, programs and/or services changes as a result of the Healthy City program	Effectiveness	Healthy City Program Quarterly Report
	New Policies, Programs and/or Services are Developed	Number of policies, programs and/or services developed as a result of the Healthy City program	Effectiveness	Healthy City Program Quarterly Report
	Solutions	Number of solutions implemented (unique from data and technology as reported earlier)	Efficiency	Healthy City Program Quarterly Report
	Tools	Number of tools implemented (unique from data and technology as reported earlier)	Efficiency	Healthy City Program Quarterly Report

Targets for each performance measure will be created during the Initiate phase. A detailed explanation of the phases of the Healthy City program is in Chapter 3 (see 3.1 Program Delivery Approach). In addition, comprehensive evaluations of individual Healthy City projects will be completed on an ongoing basis using the process described below to ensure achievement of sub-outcomes and outcomes.

2.3.1 PHASED APPROACH TO PERFORMANCE EVALUATION

A phased approach to evaluation has been developed for the Healthy City program that aligns with the three phases of program implementation detailed in Chapter 3: Initiate, Innovate and Embrace. Performance will be monitored by the program's governance structure (see 5.1.2 Healthy City Program Governance).

During the Initiate phase of the program, the focus of the Healthy City program will be primarily on achieving short-term milestones and deliverables that build the foundation for a strong Healthy City program. As the program enters subsequent phases, milestones and deliverables will focus on mid-term and long-term performance, showcasing progress towards achieving the Healthy City program's outcomes.

2.3.2 DETAILED PERFORMANCE EVALUATION OF HEALTHY CITY PROJECTS

Each phase of the Healthy City program will include a series of projects aligned to at least one sub-outcome. The City of Edmonton, along with partners and residents, will determine how best to evaluate these projects and allow for modifications to be made based on learning. A standard evaluation framework will be applied to all Healthy City projects and, at minimum, include the following details:

1. Purpose

The project purpose will articulate the community change desired as a result of this project. It will include a summary of the engagement and research conducted in support of the project's implementation.

2. Alignment to Outcomes and Sub-Outcomes

This section of the project evaluation framework will describe how outcomes will be achieved through the project's implementation. It will include research to validate the alignment of the project activities, desired community change and the selected outcomes.

3. Project Audience

The project audience will impact the development of performance measures and evaluation methodologies. Through engagement activities, members of the project audience will be invited to participate in determining how the project will be evaluated against outcomes. The project audience may include specific demographics of residents, communities of interest or practice, geographic areas and/or industry sectors.

4. Project Performance Indicators

Specific project performance indicators will be developed that reflect the community change desired and evaluate the project's success in achieving that change. Performance indicators will be monitored throughout the duration of the project using a variety of evaluation methodologies.

5. Evaluation Methodologies

Both qualitative and quantitative methodologies will be used in the evaluation of projects. The methodologies selected for each project will reflect the needs of the community and the best opportunity to evaluate the desired outcomes. The list below provides options to be considered for methodologies.

- Before/after studies
- Conversion rates
- Efficiency assessments
- Field-level observations
- Financial analysis (cost savings)
- Focus groups
- Indigenous circles
- Interviews
- Participation rates
- Point-in-time counts
- Storytelling
- Surveys
- Workshops

6. Community Indicators

Potential community indicators that can be used to complement the project performance measures and selected outcomes will be identified. These may include:

- Civic and community event participation rates
- Crime rates
- Distress calls
- Emergency room visits
- Life expectancy

7. Scalability and Sustainability

Following evaluation, and dependent on the successful outcome, projects may be scaled geographically and functionally. This would result in additional evaluation and refinement of solutions in order to increase the project's impact and reach.

This evaluation framework will be applied to the first Healthy City project: ConnectED (see 3.5 Healthy City Project: ConnectED). Over three phases, the project will work towards achieving the sub-outcomes of housing, income, jobs, community, education, environment, civic engagement, health, life satisfaction, safety and work-life balance.

2.3.3 MONITORING, REPORTING AND FEEDBACK

Smart Cities recognize the value of working within an ecosystem that is open, agile and responsive in order to ensure sustainable solutions and ultimate benefit realization for residents. In each phase and project of the Healthy City program there will be regular touchpoints with partners, stakeholders and residents. This will allow for adjustments to be made to the program or projects through a continuous and collaborative learning cycle. Ongoing evaluation is fundamental to ensuring the Healthy City program remains agile and responsive to community needs throughout the entirety of implementation. Progress on performance indicators and achievement of outcomes will be reported to residents, partners and stakeholders quarterly over the three phases.

2.4 MILESTONES, DELIVERABLES AND PAYMENT SCHEDULE

Phase 1: Initiate

The Initiate phase will be executed over the first 18 months of the program with a grant funding requirement of \$10 million. Milestones and payment scheduling for the Initiate phase are shown in Table 6.

TABLE 6: Initiate Phase Milestones and Deliverables

INITIATE PHASE MAJOR MILESTONES	COMPLETION QUARTER (END OF)	PAYMENT QUARTER (END OF)
Approved Program Roadmap and Program Management Plan	Q1, Year 1	
Established governance structure	Q1, Year 1	
PIA accepted by OIPC	Q2, Year 1	\$2 million
Approved technology and data architecture	Q4, Year 1	\$3 million
Establish Digital Innovation Collective	Q4, Year 1	
Selected vendors	Q1, Year 2	
Partner network has grown	Q1, Year 2	
Deliver Phase 1 of ConnectED	Q2, Year 2	\$5 million

Additional deliverables in this phase include:

- Engagement sessions and workshops
- Register of open datasets available in the Healthy City Ecosystem
- Privacy and security training sessions for all Healthy City Ecosystem partners and Healthy City program employees and contractors
- Maturity Assessment model is tested with Digital Innovation Collective members
- Project proposals for Phase 2 Healthy City projects
- Quarterly report back to the community

Phase 2: Innovate

The Innovate phase will be executed over 24 months with a grant funding requirement of \$30 million. Milestones and payment scheduling for the Innovate phase are shown in Table 7.

TABLE 7: Innovate Phase Milestones and Deliverables

INNOVATE PHASE MAJOR MILESTONES	COMPLETION QUARTER (END OF)	PAYMENT QUARTER (END OF)
Digital Innovation Collective Summit	Q4, Year 2	\$7 million
Partner network growth	Q2, Year 3	\$7.5 million
Delivery of Phase 2 of ConnectED	Q3, Year 3	
PIAs for projects accepted	Continuous	
Data sharing, information management and research agreements	Continuous	\$7.5 million (end of Q4, Year 3)
Delivery of Phase 2 Healthy City projects achieving sub-outcomes	Q2, Year 4	\$8 million

Additional deliverables in this phase include:

- Engagement sessions and workshops
- Digital Innovation Collective web meetings
- Maturity Assessments are completed by Digital Innovation Collective members
- Technology solution research for Healthy City projects
- Project proposals for Phase 3 Healthy City projects
- Quarterly report back to the community

Phase 3: Embrace

The Embrace phase will be executed over 18 months with a grant funding requirement of \$10 million. Milestones and payment scheduling for the Embrace phase are shown in Table 8.

TABLE 8: Embrace Phase Milestones and Deliverables

EMBRACE PHASE MAJOR MILESTONES	COMPLETION QUARTER (END OF)	PAYMENT QUARTER (END OF)
Private Investments secured	Q4, Year 4	\$6 million
Digital Innovation Collective publishes Smart City leading practices	Q2, Year 5	\$2 million
Delivery of Phase 3 of ConnectED	Q3, Year 5	
Projects transitioned to appropriate City operational area or community organization for sustainability	Q3, Year 5	
Delivery of Phase 3 Healthy City projects achieving sub-outcomes	Q4, Year 5	
Community Action Plan for Healthy City program sustainability	Q4, Year 5	\$2 million

Additional deliverables in this phase include:

- Engagement sessions and workshops
- Feasibility and best practices research for Healthy City data repository
- Empowered and engaged community has ownership over long-term direction of Healthy City program

2.5 RISKS

Risks identified for performance measurement primarily relate to establishing performance indicators, baselines and targets to accurately measure progress towards outcomes. The City of Edmonton has assessed these and other program risks related to performance measurement and has developed a series of mitigating actions to reduce their impact and likelihood. Performance Measurement risks

are shown in Table 9. Likelihood and impact are measured on a scale of 1–5, with 1 being extremely low and 5 being extremely high. The likelihood and impact measures are multiplied to establish the overall risk score. Risks with scores between 1 and 6 are given a low risk rating, 7 and 12 a medium risk rating, 13 and 20 a high risk rating, and 21 and 25 an extreme risk rating.

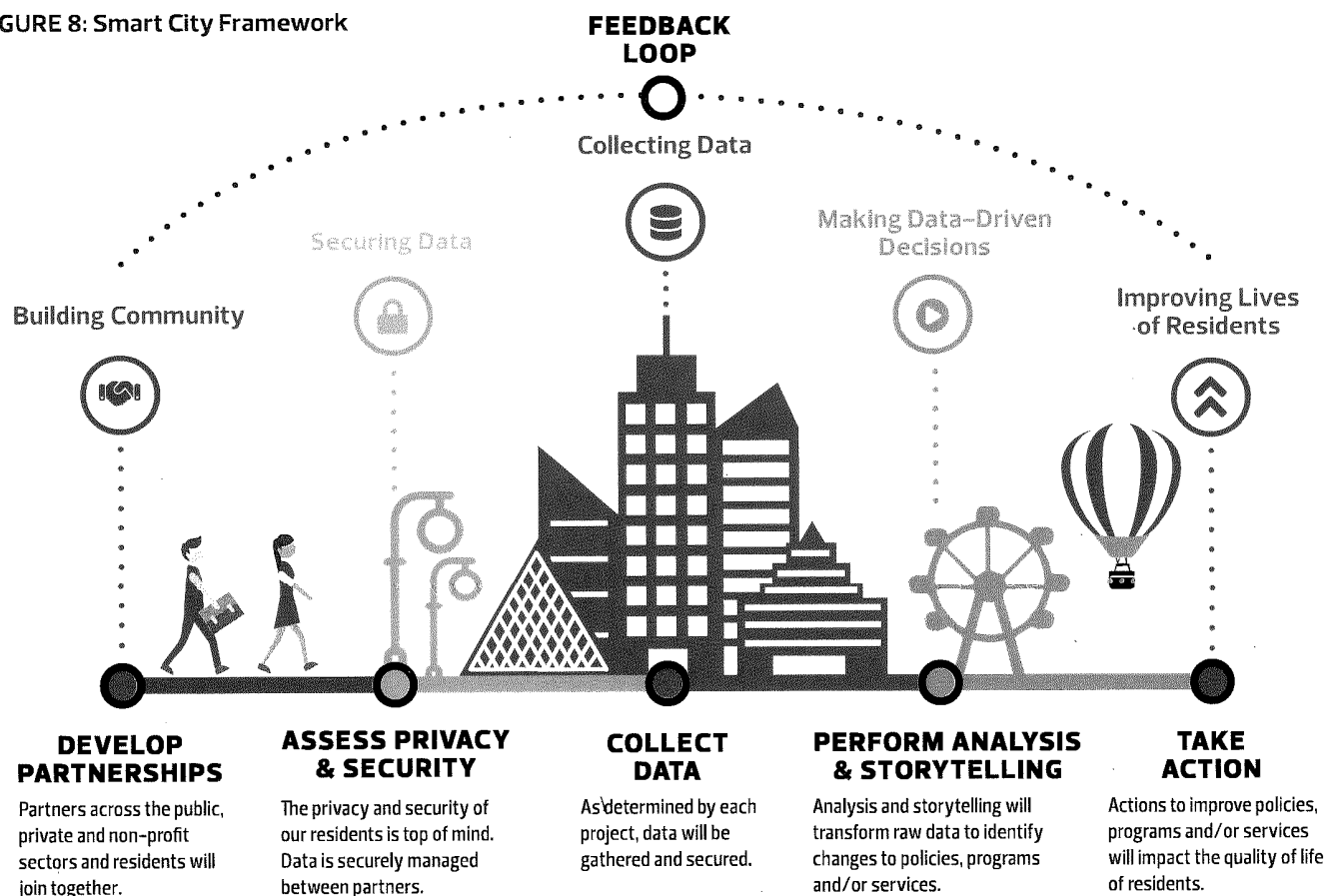
TABLE 9: Performance Measurement Risks and Mitigating Actions

RISK	LIKELIHOOD	IMPACT	RISK SCORE	RISK RATING	MITIGATING ACTIONS
Insufficient data collection strategies and data sources result in inability to measure progress accurately	1	4	4	Low	Outline clear program research and data collection methodology, including privacy and security considerations, and consult with subject matter experts and community to ensure sufficient process are in place to validate data collection and evaluation.
Misalignment of projects do not result in achieving targets or desired outcomes	1	5	5	Low	Program logic model has been developed to provide a realistic opportunity to achieve targets and outcomes. Frequent monitoring, reporting and check-ins with stakeholders and residents will enhance the program's ability to meet targets and outcomes.

3.0 PROJECT MANAGEMENT

Cities are complex systems facing a multitude of challenges in today's dynamic world. Edmonton's Smart City Framework (Figure 8) is a holistic approach to working collaboratively with residents and partners to optimize the use of data and technology, and create sustainable solutions at a municipal level.

FIGURE 8: Smart City Framework



The application of the framework will result in new and revised policies, programs and services, and innovative funding models. This framework, shown in Figure 8, is the foundation for Edmonton's phased approach to the building of a Healthy City program and ultimately healthier, more connected communities across the country.

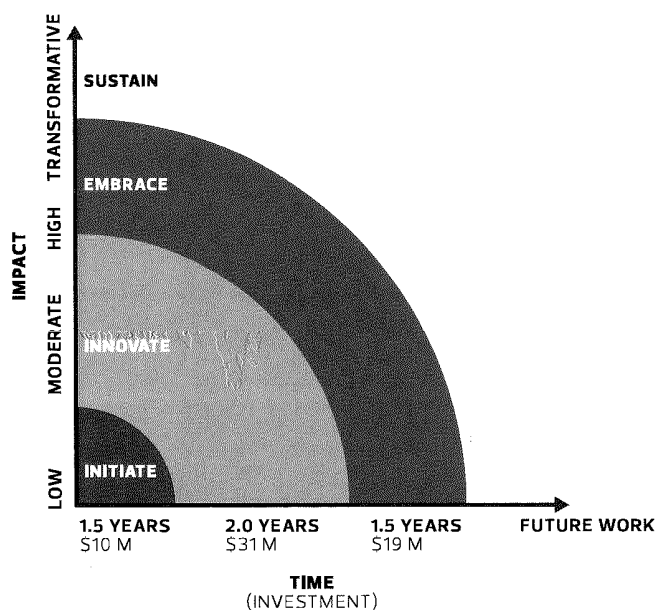
This Chapter details the program and project management methodologies that will be used to implement the Smart City Framework in the Healthy City program. It also provides an overview of the team that will make up the Healthy City Program Management Office.

3.1 PROGRAM DELIVERY APPROACH

A Smart City utilizes established project management practices to achieve sustainable community outcomes. The Healthy City program will follow program and project management methodologies from the Project Management Institute and be delivered in three phases as shown in Figure 9.

The City of Edmonton plans to invest a total of \$60 million over the three phases of the Healthy City program. This \$60 million investment is a combination of \$50 million through Infrastructure Canada, \$5 million from the City of Edmonton and \$5 million through in-kind and other private or community investments.

FIGURE 9: Phased Approach to Building Smarter Cities



The investment approach for the Healthy City program is aligned with the City of Edmonton's vision of transforming the health and well-being of residents, not just in Edmonton, but across Canada. Unlike the majority of Smart City programs, which focus solely on the deployment of technology assets, the Healthy City program will focus on the transformation of municipal programs and services through the use of partnerships, data, technology and analytics.

Phase 1: Initiate

A strong program management foundation will be established in the Initiate phase. The scope of this phase will include the following tasks:

- Establish a formal governance structure (see 5.1.2 Healthy City Program Governance)
- Approve all program planning documents, including Program Charter and Program Management Plan
- Sign the Outcome Based Contribution Agreement with Infrastructure Canada
- Execute the activities identified in the Program Management Plan
- Acquire additional resources based on the Resource Management Plan
- Deliver projects to validate the Smart City framework
- Begin to identify and prioritize Phase 2 projects
- Develop project-based data sharing agreements with Healthy City Ecosystem partners

- Establish the Digital Innovation Collective
- Monitor and evaluate results from all activities, track program benefits, deliver identified outputs linked to the outcomes (refer to Chapter 2 for more details)

These tasks are explained in further detail in 3.3 Detailed Work Streams.

Phase 2: Innovate

Building on the strong foundation established in the first phase, the Innovate phase will scale the use of the Smart City framework to larger projects, resulting in changes in policies, programs and services. In this phase, the majority of the technology and data assets will be deployed by challenging the status quo related to data sharing, privacy, security and ethics. This phase will transform not only how Edmonton approaches community-based technology solutions, but also influence the work of other municipalities across Canada through the work of the Digital Innovation Collective. The scope of this phase will include the following tasks:

- Scale the Smart City Framework
- Update the Program Management Plan and execute activities
- Sustain the projects delivered in previous phase
- Acquire additional resources based on the Resource Management Plan
- Deploy technology and data assets
- Scale Digital Innovation Collective deliverables
- Deliver best practices in data governance, ethics, quality, privacy and security
- Explore national partnerships in the Healthy City Ecosystem
- Monitor and evaluate results from all activities, track program benefits and deliver identified outputs linked to the outcomes

These tasks are explained in further detail in 3.3 Detailed Work Streams.

Phase 3: Embrace

The intent of the Embrace phase is to sustain the technology deployments and policy advancements established in the previous phases, and apply best practices in data-driven decision-making to transform municipal services and programs across Canada. The scope of this phase will include the following tasks:

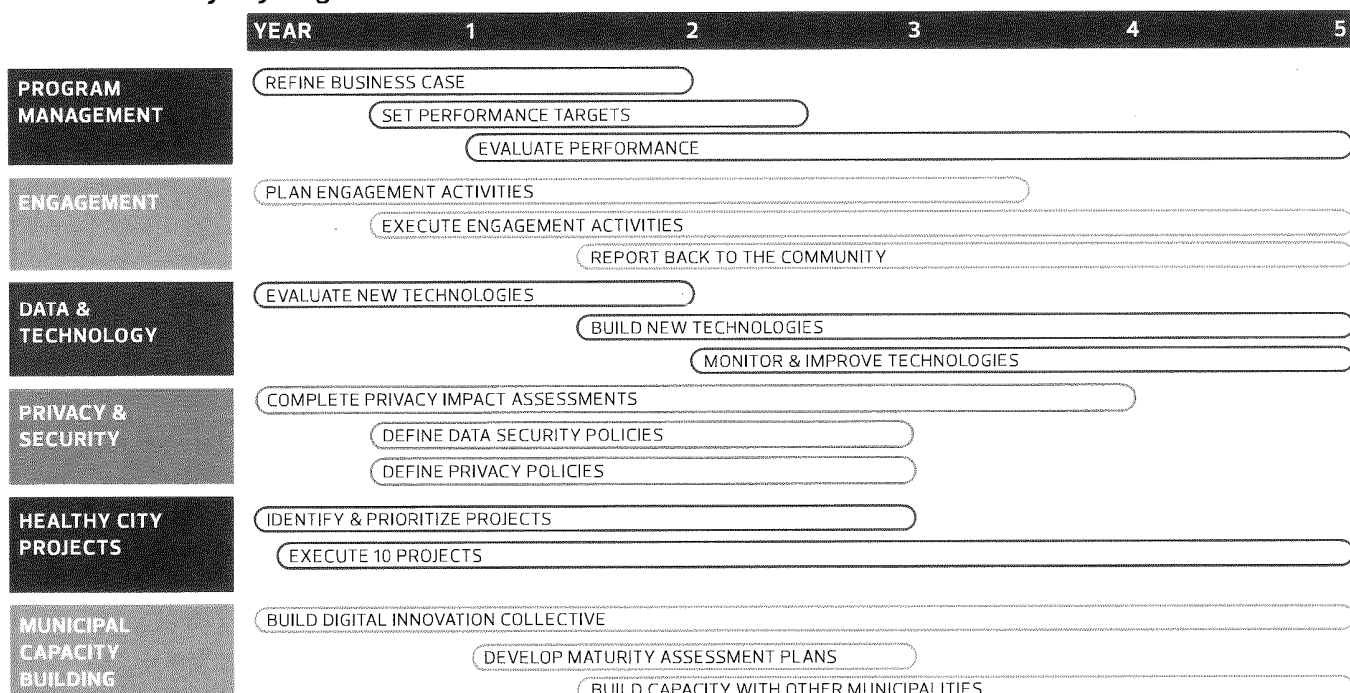
- Update the Program Management Plan and execute activities
- Sustain technology assets, policy advancements and projects delivered in this phase and the previous one
- Acquire additional resources based on the Resource Management Plan
- Mature the Digital Innovation Collective to include global participants
- Mature practices in data governance, ethics, quality, privacy and security in municipalities across Canada
- Explore private funding partnerships in the Healthy City Ecosystem
- Monitor and evaluate results from all activities, track program benefits, and deliver identified outputs linked to the outcomes

These tasks are explained in further detail in 3.3 Detailed Work Streams.

3.2 PROGRAM AND PROJECT MANAGEMENT APPROACH

The Healthy City program is a City of Edmonton program aligned with City Council's strategic plan and goals. As such, this program will adhere to established corporate program and project management approaches and controls.

FIGURE 10: Healthy City Program Gantt Chart



The City of Edmonton has established program and project management methodologies and processes that align with the principles of the Project Management Institute. The City ensures that all programs and projects are managed using this framework and that all contractors and vendors abide by the City's established processes and methodologies. In addition, the Office of the City Auditor ensures that adequate management controls are in place during program implementation and benefit realization phases. The City also provides organization-wide training in project management methodologies and ensures industry best practices are followed throughout the entirety of the project management lifecycle.

In order to align with best practices for large, complex program management, the Healthy City program has six streams of work. These work streams will ensure that strategic alignment, execution and benefit realization are managed proactively. They are described in detail in the following section.

3.3 DETAILED WORK STREAMS

Figure 10 is a visual representation of the detailed work streams and shows the estimated timing for completion of deliverables and milestones. Along with the Healthy City program phases, these work streams form the basis for the financial model in Chapter 8. The work streams and corresponding activities are explained in detail in this section.

3.3.1 PROGRAM MANAGEMENT

The purpose of the Program Management stream is to maintain the ongoing alignment of the Healthy City program with the strategic direction and goals of both the City of Edmonton and Infrastructure Canada.

The Program Management stream includes the following activities:

- **Business Case, Program Charter and Program Roadmap:** Edmonton's Smart Cities Challenge final proposal is the initial Business Case for the Healthy City program and will be approved through the program's governing bodies during the Initiate phase. It acts as a formal declaration of the value the Healthy City program will deliver and a justification for the resources that will be expended to deliver it. During the Initiate Phase, a Program Charter and Program Roadmap will be developed to align with the Business Case. During the Innovate and Embrace phases of the Program, the success criteria outlined in Chapter 2 will be monitored. Any variance between achieved and planned outcomes will be evaluated and adjustments will be made to ensure the overall success of the program.
- **Environmental Assessments:** Environmental factors refer to conditions not under the immediate control of the Healthy City program that influence, constrain or direct the program. Environmental factors may include economic, demographic, political, legal and technologic. These factors will have a significant impact on the Healthy City program's success and will be monitored on an ongoing basis.
- **Risk Management:** The successful delivery of the Healthy City program will depend on a well-defined approach to risk management. In alignment with the City of Edmonton's Corporate Risk Management Framework, the Risk Management Plan will identify program risk thresholds, perform continuous risk assessments, develop high-level program risk response strategy, and communicate risks to strategic levels of the City and Infrastructure Canada. Throughout the program's lifecycle, risk thresholds will be evaluated and communicated on an ongoing basis. An initial Program Risk Register has been developed with a table included in Chapters 2, 3, 4, 5, 6, 7 and 8 detailing the identified risks and mitigating actions. As the program

evolves, additional risks will be identified and included for monitoring and mitigation on the Program Risk Register.

- **Lifecycle Management:** The purpose of this activity is to manage the program components required to facilitate effective program definition, program and project delivery, and program closure. A program with such scale and complexity as the Healthy City program will require a flexible, yet rigorous, program management approach. Through this activity, a Program Management Plan will be developed and include the following details:
 - **Financial Management Plan:** The Financial Management Plan will identify financial resources, integrate the budgets of individual program components to create the overall program budget, and control expenditures throughout the lifecycle of the program. It will include all aspects of the program's finances including funding schedules and milestones (see 2.4 Milestones, Deliverables and Payment Schedule), budget, contract payments and schedules, financial reporting activities and mechanisms, and financial metrics.
 - **Procurement Management Plan:** The Procurement Management Plan will detail the City's innovative and effective approach to procurement. The foundation of this plan is partnerships with entities including Health City that will expand the procurement channels available for program delivery. In addition, the City has taken a proactive step in breaking down traditional procurement barriers by being the first Canadian municipality to join the [Startup In Residence](#) program.
 - **Quality Management Plan:** The Quality Management Plan will document the overall quality objectives and principles that will be shared by all components of the Healthy City program. The plan will ensure City of Edmonton quality and regulatory standards are applied consistently across all phases and components. The Quality Management Plan will be implemented through the Privacy and Security work stream.
 - **Resource Management Plan:** The Resource Management Plan will ensure that all required resources (people, materials, data, information, etc.) are made available to work streams and projects. In addition to resource allocation, the Resource Management Plan will forecast resource requirements, both internal and external, throughout the lifecycle of the program.

- **Schedule Management Plan:** The Schedule Management Plan will determine the order and timing of the program activities required to achieve the program outcomes. It will also estimate the amount of time required to deliver each activity, identify significant milestones during the performance of the program and document the outcomes of each milestone.

- **Scope Management Plan:** The Scope Management Plan will identify tasks and deliverables that align with program outcomes and exclude all work that is out of scope. As the program will be delivered over the next several years, and with the constant change in the municipal technology landscape, the scope of the program will be managed closely throughout the program lifecycle to ensure outcomes are achieved.

- **Governance:** The purpose of this activity is to enable effective and efficient program decision-making, establish practices to support the program implementation, and maintain program oversight. This activity will implement the framework, functions and processes by which the Healthy City program will be monitored, managed and supported in order to meet the desired outcomes. This is described in Chapter 5 in more detail.

- **Monitor, Report, Sustain:** The purpose of the Monitor, Report, Sustain activity is to monitor and evaluate the delivery of benefits and sustain the outcomes achieved by the Healthy City program. The activity will ensure program outcomes are measured, achieved, scaled and sustained through the following tasks:

- **Benefits Analysis and Planning:** The Healthy City program outcomes have been identified and outlined in detail in Chapters 1 and 2. These Chapters established the foundation that will guide the delivery of benefits and achievement of outcomes during the program lifecycle.

- **Benefits Monitoring:** Progress will be monitored to ensure ongoing strategic alignment of the program with the strategic priorities of the City of Edmonton, community and Infrastructure Canada through the following actions:

- > Monitor opportunities and threats affecting outcomes
- > Evaluate key performance indicators related to program financials, compliance, quality, safety, governance and stakeholder satisfaction
- > Monitor program progress in achieving benefits
- > Communicate progress through various reports, dashboards, artifacts, etc. to stakeholders, partners, residents and governing bodies including Infrastructure Canada

- **Benefits Transition:** The benefits transition step is to ensure that Healthy City program benefits are transitioned to operational areas, both within the City of Edmonton organization and to Healthy City Ecosystem partners. The transition plan for program benefits will be developed and executed in collaboration with partners and stakeholders in Edmonton and across Canada. Effective transformation will ensure new processes, capabilities and technologies are embedded in these partner organizations.

- **Benefits Sustainment:** The purpose of this step is to ensure continued generation of the benefits and outcomes delivered by the program through partnerships. The Healthy City program will develop a formal Benefits Sustainment Plan which will identify additional outcomes or benefits that will be delivered through operations, maintenance, new activities or other efforts at the end of the funding cycle for the Healthy City program.

The Initiate phase will primarily focus on ensuring robust plans are in place for program management activities. Through the Innovate and Embrace phases, these plans will be monitored and updated regularly to ensure alignment with outcomes and the successful transferability and scalability of solutions.

3.3.2 ENGAGEMENT

The purpose of the Engagement stream is to identify and analyze stakeholder needs, manage expectations, and develop communication and engagement activities to foster community support and collaborative design. This work is described in greater detail in Chapter 6. The City of Edmonton has engaged with residents, partners and other stakeholders throughout the development of Edmonton's Smart Cities Challenge final proposal and will continue to do so during the subsequent phases of program implementation. In addition, the program will extend the engagement strategy to include residents, partners and stakeholders across Canada, primarily during the Innovate and Embrace phases.

This stream will continue the development of the Engagement Plan in collaboration with the community through the following activities:

- **Stakeholder Identification and Analysis:** Initial Healthy City Ecosystem partners and stakeholders have been identified in Chapter 5 (see 5.2 Smart City Partners). During the Initiate phase, a Stakeholder Engagement Plan will be developed that addresses ongoing program requirements and evolving stakeholder needs and expectations in order to continue to build the ecosystem. The plan will also be used to deliver engagement activities and determine communication channels and frequencies to ensure accessibility for all stakeholders. During subsequent phases, the Healthy City program will continue to identify additional key stakeholders or partner groups to further enhance the Healthy City Ecosystem. The Stakeholder Management Plan will be updated regularly throughout the lifecycle of the program.
- **Engagement Planning and Execution:** An extensive Program Engagement Plan has been developed in Chapter 6. This plan will be updated regularly to identify new methods, tools and activities for working collaboratively with the community, in order to reach diverse audiences and create meaningful opportunities for public participation. The plan will ensure that residents and stakeholders have been consulted and feedback from non-profit, academic, public and private sector partners is integrated into program and project plans.

- **Communications Planning and Execution:** An initial plan to communicate with residents, partners and stakeholders has been developed and included as part of Chapter 6. It will continuously evolve to accommodate the diverse needs and expectations of the community, taking into account requirements such as the type of information communicated, language, format, content and level of detail. The Program Communication Plan will provide the opportunity for a two-way dialogue with the community and will be updated regularly throughout the lifecycle of the program.

3.3.3 DATA AND TECHNOLOGY

A foundational element of the Healthy City program is to be able to share anonymized data and information across the Healthy City Ecosystem and to develop inclusive, accessible and open technology solutions. The purpose of this stream is to maintain a holistic perspective on technology implementation and data sharing across projects, implement technology architecture best practices, and provide guidance on data governance and data quality. Chapter 4 provides a detailed plan on Data and Technology implementation. The assets created through this stream and the knowledge assimilated will be transferred to all partners in the Healthy City Ecosystem and other municipalities across Canada.

This stream consists of the following activities:

- **Technology and Data Interoperability:** Interoperability of technology and data is crucial to the success of any Smart City program. This activity will ensure industry standards and specifications for technological and data interoperability are being addressed. In the Healthy City program, the majority of technology implementation will be delivered through projects. To ensure the alignment of technologies being deployed throughout the program, a holistic understanding of technology and data architecture is crucial. This activity will eliminate duplication in technologies being implemented across the program and will ensure the greatest return on technology investments. In addition, having a centralized approach to technology planning will ensure that lessons learned from one project will be incorporated in the design of the next. Key tasks in the Initiate phase

will include the development of service-oriented and microservices architectures, data sharing guidelines and data standards. During subsequent phases, this activity will ensure architecture guidelines and standards are updated and projects adhere to interoperable and open standards.

- **Data Governance:** Through this activity, the City of Edmonton will ensure appropriate data governance practices are in place for the Healthy City program and that data ownership remains within the jurisdiction of the community and appropriate Healthy City Ecosystem partners. This is further detailed in Chapter 7.
- **Evaluate New Technologies:** Future-proofing technologies requires the continuous evaluation of new technologies, not only to develop new products but also to procure new services through vendors. While individual projects in the Healthy City program will deploy the technologies, testing and validating new technologies through pilot initiatives will be executed at the program level. This activity will ensure that lessons learned and best practices are shared across the program and with all Health City Ecosystem partners. It will also ensure these technologies are scalable to other municipalities. Lessons learned through this activity will form the basis of the Knowledge Sharing activity under the Municipal Capacity Building stream (see 3.3.6 Municipal Capacity Building).
- **Implementing Technology Infrastructure:** The Healthy City program will implement technology and data solutions to solve complex problems and achieve program outcomes. Most technology implementations will be delivered through various projects and will be specific to the problem the project is trying to solve. However, from an efficiency and interoperability standpoint, the platform infrastructures will be implemented at the program level. This will include technologies such as big data and analytics platforms, program management and reporting tools, Internet of Things management systems, identity and access management systems, and data security provisioning systems. Through this activity, along with Technology and Data Interoperability, the Healthy City program will implement common technologies required by all aspects of the program and the underlying projects. A key task in the Initiate phase includes gathering requirements from

a technological and strategic perspective. In the Innovate phase, this activity will manage the procurement, deployment and operationalizing of the technology infrastructure required by the program. During the Embrace phase, this component will collaborate with other program components to ensure the sustainability of the implemented technologies and to scale the technology infrastructure to other municipalities across Canada.

3.3.4 PRIVACY AND SECURITY

The purpose of the Privacy and Security stream is to maintain a holistic view of the program from a privacy and security perspective, develop relevant policies and procedures, and manage program risks related to privacy and security breaches. This stream will also focus on assessing the ethical considerations that go beyond current legislation related to data usage and analytics. The assets created through this stream and the knowledge gained through the activities will be transferred to all Healthy City program partners and other municipalities across Canada. Chapter 7 provides a detailed plan for Privacy and Security.

This stream will ensure data security, integrity and privacy through the following activities:

- **Data Security and Privacy Policies:** Data security and privacy is of the utmost importance to the Healthy City program. The City understands the risk implications associated with a privacy and/or security breach and will ensure adherence to policies and procedures by all program participants and partners. This activity will ensure the formalization, refresh and application of all security and privacy policies and procedures within the Healthy City program. Lessons learned and best practices will be shared with municipalities across Canada.
- **Privacy Impact Assessments:** As the Healthy City program evolves and new projects are identified, the data required to implement these projects will be identified and steps will be taken to source it appropriately. Through the development of Edmonton's Smart Cities Challenge proposal, the City has developed a strong relationship with the Office of the Information and Privacy Commissioner of Alberta and has submitted a preliminary Privacy Impact Assessment for review and feedback (see

7.2 Preliminary Privacy Impact Assessment). This activity will ensure that as new projects are identified, resources are assigned to develop Privacy Impact Assessments and acceptance from the Office of the Information and Privacy Commissioner of Alberta is received before new projects are initiated. Depending on the complexity of the projects, this activity may impact scheduling and scope.

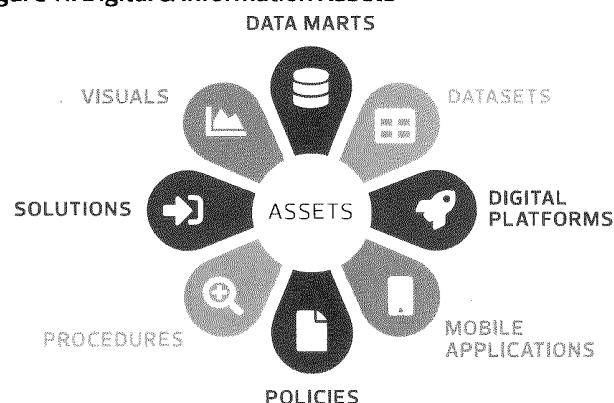
- **Data Ethics and Responsibility:** Data-driven decision-making is at the core of the Smart City Framework outlined earlier in this Chapter (see Figure 8). As a result, a comprehensive data ethics and responsibility framework is required. This activity will work to build and maintain residents' trust in the program. It will also monitor unethical or illegal use of insights or biases that intensify issues of social and economic justice or do not align with the original disclosure purpose and consent.
- **Data Sharing Agreements and Partnerships:** The core value proposition of the Smart City Framework is bringing together anonymized data from disparate sources and analyzing them to generate meaningful insights that will inform changes to policies, programs and services. In the Initiate phase, the Healthy City program will maximize the use of open data. However, as the program matures and enters the Innovate phase, there will be a requirement to access additional data from stakeholders in the Health City Ecosystem and beyond. In order to do so while ensuring data security, privacy and ethics, the program will develop robust data sharing, information management and/or research agreements with stakeholders and partners. Lessons learned and best practices will be shared with municipalities across Canada.

In addition, the City of Edmonton is currently hiring a Data and Analytics Ethics Advisor who will report to the City's Chief Information Security Officer and play an integral role in achieving the activities in this workstream.

3.3.5 HEALTHY CITY PROJECTS

The purpose of the Healthy City Projects stream is to implement high-value strategic projects and deliver benefits that will ensure the program achieves its desired outcomes. During the Initiate phase of the program, this stream will deliver ConnectED, a project that has been identified and described in further detail later in this Chapter (see 3.5 Healthy City Project: ConnectED). As new projects are identified and prioritized, this stream will create assets such as those shown in Figure 11.

Figure 11: Digital & Information Assets



Each approved project will have a common project management approach that includes the ongoing monitoring of performance, privacy and security and achievement towards outcomes. This allows for core project activities to proceed while making interim course corrections throughout implementation to optimize results and make systems and processes available to other projects.

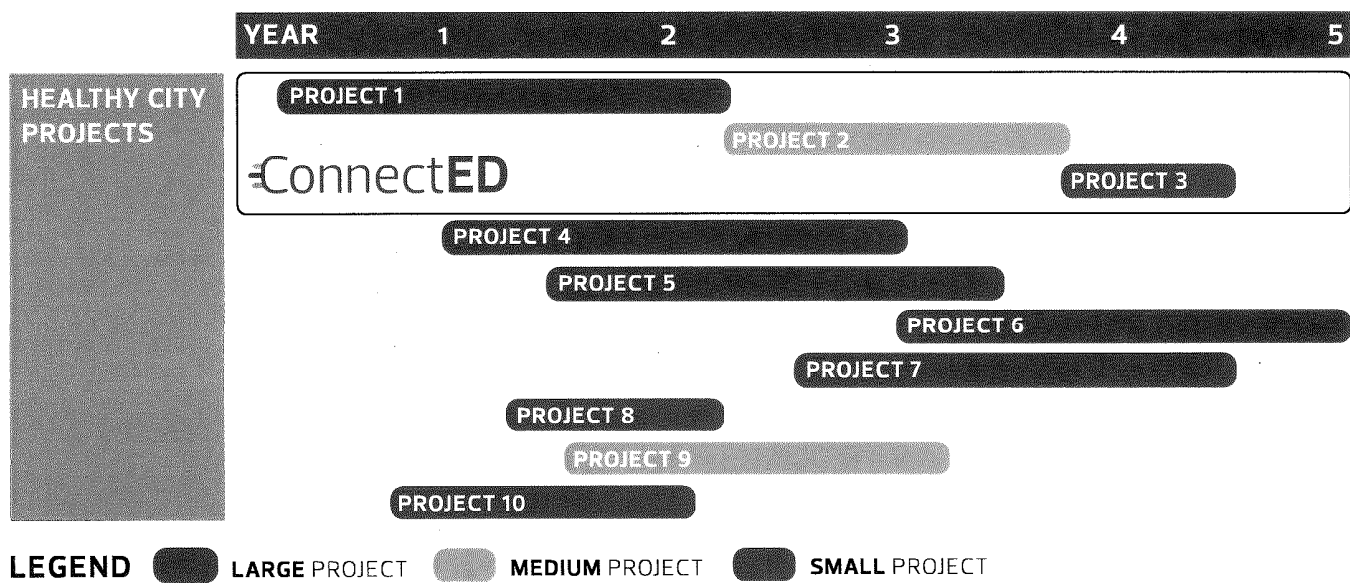
The Healthy City program is expected to implement ten projects over five years. These projects will vary in size, scale and schedule as shown in Table 10 and Figure 12.

The first Healthy City project will be ConnectED (see 3.5 Healthy City Project: ConnectED). Due to its scale and complexity, it has been broken down into three phases which are considered individual projects as each phase has a distinct deliverable.

TABLE 10: Healthy City Project Size, Duration and Cost

NUMBER OF PROJECTS	SIZE	DURATION	ESTIMATED COST (PER QUARTER)
3	Small	12-15 months	\$150,000
2	Medium	18-20 months	\$250,000
5	Large	24-30 months	\$320,000

FIGURE 12: Healthy City Projects Gantt Chart



3.3.6 MUNICIPAL CAPACITY BUILDING

The purpose of the Municipal Capacity Building stream is to ensure transferability and scalability of knowledge, experiences, processes and solutions across Canadian municipalities. This stream of work will ensure solutions and learnings are open, integrated, transferable and collaborative beyond the traditional municipal boundary and span of control. This stream directly contributes to achieving the program's second outcome of transforming how municipalities across Canada work with residents and partners to achieve excellence in data and technology.

The stream includes the following activities:

- **Digital Innovation Collective:** Edmonton will build a network of municipalities that are working towards advancing work with residents and partners through data and connected technology. This would also extend to First Nations, Métis and Inuit communities. The Digital Innovation Collective will establish the foundation for sharing ideas, learnings and solutions to enhance how municipal programs and services are delivered. In the Initiate phase, the City of Edmonton will lead the Collective in developing terms of reference and guiding principles. In the subsequent phases, the municipalities in the Digital Innovation Collective will work together to identify areas of focus and activities.
- **Maturity Assessment:** An initial Smart City Maturity Self-Assessment tool, shown in Figure 13, has been developed by the City of Edmonton. During the Initiate phase, Edmonton












will work with municipalities to modify and refine the maturity framework. In subsequent phases, this tool will be utilized by all members of the Digital Innovation Collective to assist with prioritizing areas for growth.

- **Capacity Building:** The Healthy City program will work towards transforming how municipalities across Canada work with residents and partners to build healthier cities. As a result, the Healthy City program is focused on building capacity not only in Edmonton but also in municipalities across Canada. The Initiate phase of the program will identify community needs based on the Maturity Assessment described above and develop a change management framework. During the Innovate phase, this activity will focus on specific actions such as planning for the operational, financial and behavioural changes necessary for all Healthy City Ecosystem partners to incorporate transformational change across their organizations. As the program evolves during the Embrace phase, the program will work towards ensuring the knowledge, experiences, processes and solutions are scaled and sustained in Edmonton and across Canada.
- **Open Source Knowledge Sharing:** This activity will share knowledge and technology with other municipalities through open source technologies. Sharing open source code is not new; however, instead of simply sharing code over open source platforms, this activity will build ongoing collaboration and contribution to these shared open source

projects by municipalities across Canada. During the Initiate phase, the focus will be to finalize the technology and legal framework to ensure this activity is feasible.

During the Innovate and Embrace phases, this activity will scale the approach to include all Health City Ecosystem partners municipalities across Canada.

FIGURE 13: Maturity Assessment

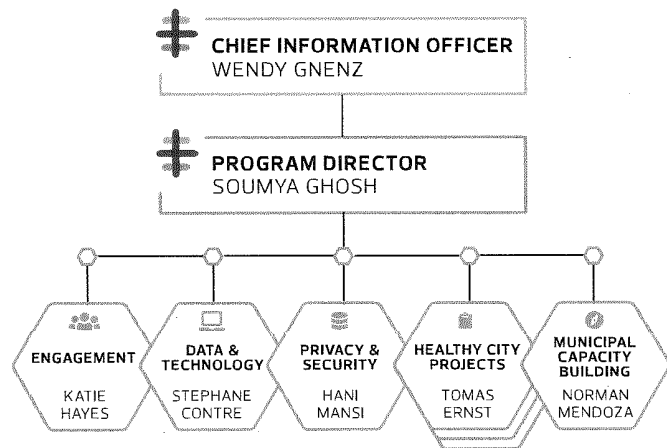
				
CATEGORY	LISTENING	LEARNING	MANAGING	LEADING
 Open Data Advancement	There is recognition that open data is a foundation for further Smart City initiatives. Market scanning and proof of concepts with vendor solutions is common.	Open Data policy is under development. Data use, privacy and security guidelines are not fully established. Requests for data are frequently declined by internal stakeholders.	Open Data Policy is in place; data use, privacy and security guidelines are established and institutionalized. Requests from residents, internal City areas and elected officials is commonplace.	Open data is a foundational benefit to the partnership's ecosystems. The value realized through partners' use of the data is measurable.
 Data Management Practices	The need for improved data management practices is recognized, but initiatives to define data management standards and processes, and policies are recognized as important and are not yet in place.	Small scale re-use of data to fuel smart solutions and data analytics. Pilots using business intelligence tools emerge. Initiatives to define data management standards, processes and policies are in place.	Data is combined from multiple sources in new and creative ways. Data analytics are applied to provide new insights. Data management standards and processes are being implemented.	City-wide use of mature advanced data analytics (real-time, big data, predictive). Most data is available via open standards. Operational data management standards and processes exist and data quality is guaranteed.
 Culture of Innovation	There is recognition that the benefits that innovation will bring to cities will require an increased tolerance of risk.	There is opportunistic innovation happening across the organization. Partner innovation models are being tested.	Systematic innovation is primarily focused on ideas from inside the City and engages some partners and residents.	Innovation is encouraged, institutionalized and managed. Residents and partners are consistently involved in innovations in the City.
 Resident Engagement	There is recognition that Smart City approaches benefit from design thinking that includes significant resident engagement.	Different methods and channels of engagement are experimented with and evaluated.	Multiple channels are used to engage residents based on their needs. Formalized processes and methods are being created.	A formalized city-wide engagement model enables ongoing and inclusive interactions with residents.
 Technology Readiness	There is recognition that fragmented and siloed architecture and systems are impediments to Smart City initiatives.	Data provisioning and analysis tools are implemented and usage is small, but growing. The use of Application Programming Interfaces for integration is ad hoc.	Data provisioning and analysis tools are implemented and well utilized. Event-driven Application Programming Interfaces are implemented and used to create visibility of data across City systems. Integration within partnership ecosystems is becoming more commonplace.	Open platforms allow data to be visible and leveraged across the City and between and within partnership ecosystems.
 Partnership Ecosystems	The City is occasionally connecting with its ecosystem of academia, government organizations, businesses and residents. Collaboration is ad hoc or fragmented.	The ecosystem is engaged and collaboration on Smart City initiatives is encouraged. New processes, procurement and legal mechanisms are being created and tested. Collaboration is intentional.	An ecosystem model that involves all levels of government, academia, business and residents is involved in Smart City initiatives. Collaboration is systematic.	Collaboration is based on shared outcomes and results in a flow of new products, services, and transformed business models.
 Privacy & Security Awareness	Recognition of and assessment of issues with privacy and security is occurring.	Mitigations to privacy and security issues are reactive. Efforts to increase awareness are initiated.	Sustainment of privacy and security awareness is achieved. Technology and data management architectures are adapted to respond.	Privacy and security is being established to enable partnership ecosystems.

3.4 EDMONTON'S HEALTHY CITY PROGRAM MANAGEMENT OFFICE

Edmonton's Healthy City Program Management Office structure is shown in Figure 14.

A short biography for each of the individuals listed in the Program Management Office has been included to demonstrate the readiness of this team and ability to achieve effective and timely results.

FIGURE 14: Healthy City Program Management Office



Wendy Gnenz, Chief Information Officer

Wendy Gnenz provides corporate leadership for digital enablement and innovation, data and analytics, technology planning and all aspects of technology infrastructure operations for the City's 14,000 employees and nearly one million residents. In this role, she is leading the transformation of data and technology through reimagining how partnerships and usable information can provide innovative, integrated services to residents. In the workplace, Wendy has fostered a culture of collaboration through the motto "Think Yes," which encourages staff to always approach issues/problems with a can-do attitude.

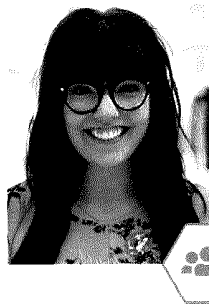
As a Chartered Professional Accountant and a Certified Management Consultant, Wendy brings with her a wide variety of experience in strategy, process, technology and consulting from her work in the health industry, municipal and provincial governments, and private sector organizations.



Soumya Ghosh, Program Director

Working with community partners, Soumya Ghosh aims to advance the Open City and Smart City portfolios by driving innovative technology-focused solutions to improve resident services. Additionally, Soumya is responsible for managing the City of Edmonton's award-winning Open Data program and developing the Smart City proposal for Infrastructure Canada's Smart Cities Challenge.

Prior to joining the City of Edmonton, Soumya worked as an IT consultant with Fortune 500 companies such as Oracle Corporation, McKesson Corporation and Deutsche Bank. He completed his MBA from the University of Alberta, has a Bachelor of Engineering degree and is PMP certified.



Katie Hayes, Engagement

Katie Hayes works with organizations and the community to identify opportunities for making places more vibrant, healthy and safe. She works collaboratively to transform processes and programs for community benefit. She has led community engagement and stakeholder relations activities with programs including Edmonton's Capital City Clean Up Graffiti Management and Strathcona County Victim Services.

She has a Bachelor of Commerce degree and a Masters degree in Community Development. She dedicates much of her free time to volunteering with community organizations and events.



Stephane Contre, Data and Technology

Stephane Contre leads the City's Analytics Centre of Excellence, whose mission is to assist the City in understanding and leveraging analytics to improve business outcomes. A passionate analytics professional, Stephane has developed a corporate-level consultation service that supports the City's modernization and innovation agenda through the use of statistics, business intelligence, predictive modelling and advanced analytics.

Prior to working for the City of Edmonton, Stephane served as an Army Officer in the Canadian Forces, was a Police Officer in Ottawa and also worked as a security contractor overseas.



Hani Mansi, Privacy and Security

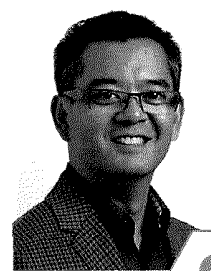
Hani Mansi brings 28 years of work experience, spanning many different industries, having worked for organizations such as IBM, ATB Financial, Workers Compensation Board and most recently, ATCO Group. Throughout his career Hani has focused on the creation, management and optimization of security programs, with responsibilities that have included Information Security, Risk Management and Cyber Security.

Hani has a Bachelor of Science degree from the University of Alberta, numerous certifications related to Information Security and Risk Management, is a Board Member for the Alberta Chapter of the International Information System Security Consortium and has been a speaker at a number of Information Security events throughout Canada.



Tomas Ernst, Healthy City Projects

Tomas Ernst is a bilingual professional with over 15 years of experience in local, provincial, federal and international civil service. He has a Bachelor of Commerce degree and a Masters degree in International Relations. Tomas' start-up company, donate2play.com, was recognized for its innovation by Boulevard Magazine in transforming the financial practices of nonprofits. He spent eight years as a Project Manager working with the United Nations and World Bank Group in Australia, Europe, East Africa and the Middle East. He has served as Acting Branch Manager and Director in the Citizen Services Department at the City of Edmonton prior to joining the Open City and Technology Branch.



Norman Mendoza, Municipal Capacity Building

In his role leading innovation and open data, Norman Mendoza is involved in helping Edmonton continue its evolution into a Smart City. Norman recently joined the steering group for the Municipal Innovation Pilot Project as the City of Edmonton's representative. Along with the City of Montreal, City of Guelph, Region of Durham, Region of Niagara, City of Sarnia, MISA Ontario, FCM Innovation Network and the Government of Canada's Digital Enablement Unit, the group is building collaborative communities around open source projects for cities.

Prior to joining the City, Norman was a serial entrepreneur in Edmonton's technology startup community, which provides a unique combination of perspectives and approaches that can be used to help the City promote collaboration and partnerships with the technology community, post-secondary institutions, and businesses.

3.5 HEALTHY CITY PROJECT:

ConnectED

The Healthy City program will work to build a digitally inclusive city where residents have increased access to programs and services that positively impact their quality of life. One of the ways in which this will be achieved is through the creation and ongoing evolution of ConnectED, a digital tool for residents that will integrate information from various sources into a user-friendly format. This tool will be agile and adaptable, able to provide residents with the information they require as they move through the various stages and circumstances of life. Residents will have the ability to customize the digital tool to their personal preferences and needs based on where, when and how they would like to access programs and services.

The purpose of ConnectED, as the first project of the Healthy City program, is to validate the effectiveness of the Smart City Framework and the processes established in the Healthy City program. Through engagement and research, this project has been identified to meet residents' needs. It also aligns with the Healthy City program outcomes and has strong support through existing City of Edmonton and partner initiatives.

In the Initiate phase, the Healthy City program will work with residents and partners to develop and evaluate ConnectED technology and complete a Privacy Impact Assessment. During this phase, ConnectED will maximize the use of municipal and community open data. As the Healthy City Ecosystem grows during subsequent phases, additional Privacy Impact Assessments will be completed for ConnectED. This will increase the diversity of data and information available to residents through the digital tool.

In the Innovate phase, ConnectED will become accessible through additional digital channels, including existing and additional kiosks in public spaces, and other smart devices and connected technologies in the home and community.

During the Embrace phase, through ensuring compliance with the privacy and security legislation and expectations of residents, ConnectED will also enable two-way communication and data-sharing to allow the stakeholders in the Healthy City Ecosystem to analyze information at an aggregated neighbourhood or population level. The

access to anonymized and aggregated data will give service providers and policymakers the ability to perform analytics and determine the relevance, effectiveness and efficiency of current and planned programming as well as make recommendations, ranging from changes in services to full policy amendments. As the adoption of the tool progresses, the Healthy City program will engage with innovative wearable-technology manufacturers to build further connections between the community and residents by providing the option to incorporate residents' wearable data into their ConnectED experience.

The purpose of ConnectED, as the first project of the Healthy City program, is to validate the effectiveness of the Smart City Framework and the processes established in the Healthy City program.

3.6 RISKS

Potential project management risks include lack of technical expertise to complete deliverables and ineffective change management processes. These risks will be amplified as the program moves from the Initiate phase to the more complex Innovate and Embrace phases. The City of Edmonton has assessed these and other program risks related to project management and has developed a series of mitigating actions to reduce their impact and likelihood. Project Management risks are shown in Table 11.

Likelihood and impact are measured on a scale of 1-5, with 1 being extremely low and 5 being extremely high. The likelihood and impact measures are multiplied to establish the overall risk score. Risks with scores between 1 and 6 are given a low risk rating, 7 and 12 a medium risk rating, 13 and 20 a high risk rating, and 21 and 25 an extreme risk rating.

TABLE 11: Project Management Risks and Mitigating Actions

RISK	LIKELIHOOD	IMPACT	RISK SCORE	RISK RATING	MITIGATING ACTIONS
Inability of contractors to deliver on projects results in program delays	1	4	4	Low	Strong contract management practices are in place to ensure ongoing oversight including robust evaluation of vendors and regular reporting.
External factors (economic, environmental, etc.) result in program delays	2	2	4	Low	Complete ongoing environmental scans and update timelines accordingly. Review economic forecast and adjust timelines if required.
Complexity of projects results in increased legal liability	1	5	5	Low	Robust privacy and security processes are in place to ensure liability is managed appropriately.
Insufficient resources (financial, human, information, tools, etc.) result in program delays	2	3	6	Low	Prioritize program initiatives and projects and assign resources as required. Develop succession plan to ensure continuity in the event of reduced resources. Identify unique skill sets required for program implementation and recruit proactively.
Lack of executive support results in program not achieving desired outcomes	2	3	6	Low	Complete continuous stakeholder assessments. Ensure ongoing communication with senior leaders. Develop continuity plan.
Inaccurate cost forecasts result in inability to implement all desired solutions	2	4	8	Medium	Prioritize program initiatives and projects and reallocate resources when required. Continuously market scanning to ensure cost effective decision-making.
External factors (partner readiness, economic, etc.) result in unsustainable and non-transferable solutions	2	4	8	Medium	Partner readiness is assessed at the beginning of projects to ensure ability to achieve outcomes. Ongoing development of partnerships will lead to new opportunities for funding sources.
Program scope creep results in inefficient use of resources	3	3	9	Medium	Program initiatives and projects are prioritized based on ability to achieve outcomes. Scope will be managed for individual projects and for the program as a whole through established project management processes.

4.0 DATA AND TECHNOLOGY

Progressive organizations around the world continually reimagine themselves through innovative digital tools, systems and processes. In today's dynamic environment, it is imperative for municipalities to understand the role technology plays in building smart, sustainable cities and addressing complex societal challenges in a collaborative setting. Urban planning needs to embrace the digital opportunities that contribute to the vibrancy and sustainability of places and refrain from taking a siloed approach to managing investments in connected technology and physical infrastructure.

The usability of data and information is dependent on the technology used to create, access and manage it. As such, the City of Edmonton is presenting a combined data and technology plan as part of the Smart Cities Challenge final proposal. Through the use of data and connected technology, the City of Edmonton is rethinking the planning and development of urban landscapes and the delivery of services in order to avoid the inefficiencies of today and build a healthier, more connected City of the future. The built environment will influence health outcomes and impact the way residents feel, both physically and mentally. Data and connected technology will be used within the Healthy City Ecosystem to improve well-being in Edmonton by creating spaces and solutions that are accessible, vibrant and inclusive, that celebrate the unique features of the city and its residents, and increase security and reduce isolation.

4.1 THE HEALTHY CITY PROGRAM DATA AND TECHNOLOGY PLAN

Residents' relationship with technology is constantly evolving. To meet the diverse and dynamic needs of residents and community, cities must build and strengthen internal and external collaboration and better leverage the data, business solutions and diverse technologies that exist. Edmonton's Business Technology Strategy provides a strategic framework to connect all of these pieces in order to transform Edmonton and the region it occupies into a place that meets the expectations of the modern world. The Business Technology Strategy is the foundation from which the Data and Technology Plan has been developed.

The Data and Technology Plan also follows ISO 37106: 2018 Guidance on Establishing Smart City Operating Models for Sustainable Communities. The premise of the ISO framework

is to lead the transformation of the traditional municipal operating model to empower the community through data. It will also break down silos that inhibit truly resident-centric service delivery and enable digital inclusion in ways that are not achievable through traditional technology approaches. Through the implementation of the following two initiatives, the Data and Technology Plan will deliver directly on these transformational opportunities.

4.1.1 DATA ACCESSIBILITY AND SHARING

A foundational element of the Healthy City program is to increase the capacity for data accessibility and sharing within the Healthy City Ecosystem and in municipalities across Canada. Through this increased capacity, the use of data can be optimized to enhance the development and delivery of programs and services for residents, as well as enhance and animate the physical spaces they occupy. This consolidation of disparate data through partnerships also increases the ability for organizations and municipalities to identify gaps and biases and work together to resolve them.

The City and its partners have significant and valuable amounts of open data. In the Initiate phase of program implementation, the Data Accessibility and Sharing initiative of the Data and Technology plan will begin with the creation of a register of open datasets available for collaborative use. This will enable the collaborative identification of potential projects and allow for data to be analyzed with the intent to discover useful information, form the foundation for creating solutions and ultimately support decision-making.

The City of Edmonton currently has over 2,000 data assets in the Open Data Portal. All of this data is publicly available and has been obtained and published under an established set of management controls and approval processes.

These processes include steps to ensure both Freedom of Information and Protection of Privacy Act and legal requirements are met and approvals for the release of data have been received prior to it being published.

The Open Data Portal also makes available certain datasets that are external to the City of Edmonton. The Edmonton Police Service, Edmonton Public Library, Alberta Environment and Parks and EPCOR have all shared data to be used in this tool for residents and community. This data is anonymized and was made available to the Open Data Portal through data sharing agreements with the City of Edmonton.

Data analysis will be paired with community consultation throughout the entirety of the implementation of the Healthy City program and is not a stand alone activity. Examples of this data analysis include data clustering, data matching, data mining and advanced analytics.

As the Healthy City program progresses, it will lead to projects or initiatives that require the sharing of data that does not exist in an open platform. In the Innovate phase, the City along with its partners will assess the risk of using this type of data and determine if the opportunity is appropriate. If deemed acceptable, a data sharing, information management or research agreement would be created and the necessary steps would be taken to share and secure the data for the duration of the project. The data sharing agreement would also articulate what happens to the data following the completion of the project. In order for the data sharing between partners to be successful, members of the Healthy City Ecosystem must ensure that all data housed on their platforms is secure, including appropriate authentication and authorization rules for those who have access to internal data. The Data and Technology work stream will develop the foundational technology infrastructure so that the individual projects can retrieve, store and analyze data.

During the Embrace phase, the Healthy City program and its partners will conduct research into best practices and pursue the potential of building a Healthy City data repository. This repository would consist of anonymized data from partners within the Healthy City Ecosystem and allow for greater capacity and flexibility to analyze data for gaps and biases. It would be a flexible platform for secure anonymized data sharing between both internal and approved external users

within the Healthy City Ecosystem and would allow for multiple data sources and data types to be securely available for consumption and use.

Throughout the three phases, as the Healthy City Ecosystem grows and data accessibility and sharing increases, ConnectED, the resident tool described in Chapter 3 (see 3.5 Healthy City Project: ConnectED), will also grow.

4.1.2 SHAREABLE SOLUTIONS

As the data and technology landscape evolves, so does the ability for Canadian municipalities and governments to realize innovative opportunities through the sharing of their experiences and solutions. This begins with sharing code and best practices as municipalities are often striving for similar outcomes through building and procuring the same solutions. However, the truly transformative nature of data and technology is not achieved by simply sharing open source code. It is done through building a network of cities and their respective innovation ecosystems that will extend and sustain the new digital products that residents expect. This is a new business model opportunity where the efforts of each city and their community partners is multiplied, rather than duplicated. The Data and Technology Plan for the Healthy City program includes active engagement of the network and community around the analytic and digital products that are created through all phases of the program.

Throughout the Initiate phase and with the establishment of the Digital Innovation Collective (see 3.3.6 Municipal Capacity Building), the City of Edmonton will continue as an active participant in the Federation of Canadian Municipalities and Government of Canada Municipal Innovation Pilot Project. The City of Edmonton will also be able to provide municipalities across Canada with a series of shareable solutions as shown in Table 12.

TABLE 12: Shareable Solutions

PROJECT	DESCRIPTION	EASE OF REPLICABILITY / TRANSFERABILITY (5 – HIGH TO 1 – LOW)
You Can Benefit	You Can Benefit, a made-in-Edmonton web tool, provides individuals, families and community workers with information on available municipal, provincial and federal benefits. Built using open source content, You Can Benefit can be shared with other organizations and municipalities nationwide.	5 – Municipalities who use this code require foundational open data and analytics. A strong and collaborative working relationship with benefit providers is an additional requirement in order to acquire the necessary data.
Emergency Operations Demand Dashboard	The wildfire that forced 88,000 people in Northern Alberta to flee their homes in 2016 required a municipal response that was nimble and adaptive. In an effort to support the evacuation efforts, City of Edmonton staff developed and deployed an analytic dashboard to monitor the ever evolving demands. By consolidating real-time evacuee service reporting, the dashboard empowered municipal decision-makers with the information necessary to make critical service delivery decisions in uncertain and ever-changing times.	5 – Municipalities who use this code require foundational open data and analytics.
Transit Security Deployment Model	Edmonton Transit Security adopted the Transit Security Deployment Model, an approach that optimizes the deployment of Transit Peace Officers to trouble locations in a timely manner along the transit network. The Transit Security Deployment Model uses cutting-edge data mining algorithms to automatically analyze current transit incident data to deploy Officers where they are needed the most. Since its introduction, Edmonton Transit Security has seen its number of proactive incidents go up by 159 per cent while reactive events have gone down by 52 per cent.	3 – Municipalities who use this code must be confident in their open data and analytics maturity.
Optimized Needle Response	The Optimized Needle Response solution overhauled the municipal strategy that was in place to manage discarded needles by way of leveraging data to forecast anticipated resident complaints and incorporate route, needle box and shift optimization. In addition to increased operational efficiencies, the Optimized Needle Response has resulted in a near \$200,000 cost avoidance per year.	3 – Municipalities who use this code must be confident in their open data and analytics maturity.
Safety Code Inspector	The City of Edmonton performs over 50,000 inspections a year on newly built houses. In order to reduce the burden of this workload while upholding the integrity of the inspections, the City developed a predictive analytics software. This solution is able to identify low-risk safety code inspections, freeing up resources to concentrate on higher-risk safety code inspections. Currently being piloted in Edmonton, the goal is to reduce annual inspections by 10 per cent (5,000) per year.	2 – Municipalities who use this code must be advanced in their open data and analytics maturity.

During the Innovate phase and as the Digital Innovation Collective grows and matures, the focus will be on capacity building and sharing open source projects with municipalities across Canada. The Embrace phase will emphasize the sustainability of solutions within the ever-changing technology landscape and dynamic municipal environment.

4.2 PILOTING AND TESTING RESULTS

Throughout Edmonton's preparations for the Smart Cities Challenge initial application and since being named a Finalist, the City has conducted pilot projects to test and validate the proposed Smart City approach. These are summarized in the two charts in Chapter 1 under Progress to Date on Outcomes (see 1.3.4 Progress to Date on Outcomes).

4.3 FUTURE-PROOFING TECHNOLOGIES

As cities continue to embrace disruptive innovation and technologies, the challenge of future-proofing becomes increasingly complex. The City of Edmonton has developed effective processes to work with the community to identify and test new technologies to advance municipal programs and services. Through the City's broad partnership base, extensive subject matter expert network and ongoing engagement with residents, Edmonton has the capacity to recognize potential future-proofing issues and proactively make adjustments to the program in order to ensure ongoing success.

With a focus on data sharing enabled through service-oriented and microservices architecture, the City of Edmonton will address the challenge of future-proofing. This approach places a priority on how the interface between systems is created rather than how the specific technology is being used. Systems will evolve and change, but the value created through data sharing is sustained.

When technologies are considered for projects within the Healthy City program, a standard and open approach to tool connectivity will be a mandatory requirement. The skill set required to bring together these types of services already exists in the City's workforce and is expanding amongst staff whose work focus is on data analytics. Additionally, building software using service-oriented architecture is commonly taught in post-secondary institutions, resulting in a growing talent base to perform this work going forward.

4.4 LEGISLATIVE COMPLIANCE AND STANDARDS FOR DATA AND TECHNOLOGY SOLUTIONS

The City of Edmonton recognizes the importance of understanding and incorporating standards into the development and implementation of data and technology solutions. This section outlines standards and strategies the City of Edmonton has and will utilize to ensure interoperability and replicability of all data and technology assets.

All data and technology solutions will be evaluated based on conformity to the following ISO standards:

- ISO 37106 Guidance on Establishing Smart City Operating Models for Sustainable Communities
- ISO 27001 Managing Information Risks
- ISO 27017 Controlling Cloud-Based Information Security
- ISO 27018 Protecting Personal Data

In addition, the following standards, toolkits and strategies will be considered as technology solutions are developed. This will ensure interoperability between the technologies and other existing community systems and services. It will also increase opportunities for infrastructure replicability and scalability.

- [Report to the Clerk of the Privy Council: A Data Strategy Roadmap for the Federal Public Service](#)
- [Government of Canada Digital Standards](#)
- [Canada's Spatial Data Infrastructure](#)
- [Canada's Digital Geospatial Metadata](#)
- [Canadian Standards for Big Data Analytics](#)
- [Cyber Security - Government of Canada](#)
- [CIO Strategy Council](#)
- [Smart Cities for All](#)

Chapter 7 (see 7.3.1 City of Edmonton) provides a complete listing of City Policies, Administrative Directives and Technical Standards that will guide the implementation of the Healthy City program, as well as ensure compliance with other legislative requirements at the provincial and federal level.

4.5 THE CITY OF EDMONTON'S DATA AND TECHNOLOGY SOLUTIONS ARE INCLUSIVE AND ACCESSIBLE

Smart cities are inclusive and accessible. They develop and use innovative technologies to benefit all residents and create equitable opportunities to live healthy, safe and joyful lives. The City of Edmonton prioritizes being inclusive and accessible. In 2016, the City of Edmonton's Open Data Portal was awarded the Canadian Open Data Award for Accessibility by the Open Data Society of British Columbia and Open North.

Throughout the development and implementation of technology solutions for the Healthy City program, the City will engage key stakeholders and subject matter experts to offer their perspectives regarding content, accessibility and usability. The City will also work directly with residents to ensure the identification and creation of inclusive technology solutions that are responsive to evolving needs.

Understanding and mitigating data biases and gaps will also contribute to the accessibility and usability of technology solutions. The City of Edmonton will work with subject matter experts to understand how biases in data can be verified and what mechanisms can be put in place to overcome negative effects. In addition, the members of the Healthy City Ecosystem will work together to ensure populations that are typically underrepresented in data are provided the opportunity to participate in engagement activities that are meaningful and relevant to them. This is explained in greater detail in Chapter 6 (see 6.4 Inclusive Engagement).

4.6 EDMONTON'S DATA AND TECHNOLOGY PARTNERS

As evidenced in the Business Technology Strategy, the City of Edmonton views partnerships as being critical to the advancement of a modern municipal corporation. Specifically, the City has developed strategic partnerships with technology collaborators who are essential to the continued growth of Edmonton as a Smart City. As the Healthy City program progresses, the City will align the contributions of existing and new partners with the evolution of the Data and Technology Plan. This means that vendors will have new contractual requirements, including the enablement of open data, incentives for innovation and collaboration, and new models for collaboration based on shared outcomes. Furthermore, as the regulatory environment for data and technology evolves, the City of Edmonton expects data and technology partners to assist and respond to changing regulations.

Data and technology at the City of Edmonton is supported by several partners today. A selection of these partners are listed in Table 13.

TABLE 13: Technology Partners

PARTNER	ROLE
BetaCityYEG	BetaCityYEG connects public employees, residents and members of Edmonton's technology and data community to address the city's and region's pressing issues.
CISCO	CISCO provides the City of Edmonton with networking and connectivity hardware where required.
Edmonton Public Library	As Edmonton's largest lender of information and entertainment, Edmonton Public Library creates connections to help, grow, inspire and change. A pillar in our City, Edmonton Public Library continues to reimagine the modern library and best serve the growing and changing needs of Edmontonians.
Esri	Governments collect and manage vast amounts of location-related data — the City of Edmonton is no exception. From the City's use of ArcGIS to Story Maps, Esri has and continues to make a lasting impression as a critical partner.
Health City	Health City is an economic development initiative that catalyzes, accelerates and connects the health innovation ecosystem in Edmonton and the surrounding region.
Google	Edmonton was the first Canadian municipality to migrate its email and office applications to the Google Suite. In addition, the City's partnership with Google includes everything from large-scale event sponsorship to supporting the movement of analytics to action.
Oracle (APEX)	From coordinating evacuation efforts during emergencies to keeping tabs on significant projects, the City's partnership with Oracle (APEX) provides a low-code development platform that fuels many scalable and secure apps at the City of Edmonton.
R-Brain	The City of Edmonton has embraced the resurgence of data science in municipal government — a trajectory empowered by a partnership with R-Brain. R-Brain is a data science platform that provides data scientists with the tools they need when developing models with popular open source languages.
SAP (Business Objects)	Business Objects, a reporting and analytics business intelligence platform that is offered as a result of the City's partnership with SAP, enables data discovery and the generation of reports that visualize insights.
Startup Edmonton	Transforming ideas into some of Canada's most exciting and successful startup and scaling companies, Startup Edmonton works with entrepreneurs as they build and grow tech-enabled products and companies.
Tableau	One of the best ways to tell a story related to data is with a compelling visualization, which explains why the City's usage of Tableau has skyrocketed over recent years — from 36 users in 2015 to 3,113 at the end of 2018. The City's partnership with Tableau enables the creation of informative visualizations that help City staff make evidence-based decisions.
TEC Edmonton	A partnership between the University of Alberta and the Edmonton Economic Development Corporation, TEC Edmonton operates the Edmonton region's largest accelerator for scale-up technology companies and manages the commercialization of University of Alberta technologies.
Tyler Technologies	Originally launched as "the world's easiest database," Socrata supports the City's data as a service platform that aims to reduce government silos. It is the platform that powers the award-winning Open Data Portal.
What Works Cities	The What Works Cities Initiative, a program launched by Bloomberg Philanthropies in April 2015 and delivered by the Center for Government Excellence (GovEx) at Johns Hopkins University, partnered with the City of Edmonton to help prioritize data management efforts, address current challenges and identify opportunities for improvement. It is a partnership focused on increasing data-driven decision-making through effective data governance.

4.7 RISKS

Potential risks identified for technology relate to the pace of technology change, the dependence on the open source development community, and the availability of specific technology skill sets. The City of Edmonton has assessed these and other program risks related to technology and has developed a series of mitigating actions to reduce their impact and likelihood. Data and Technology risks are shown in Table 14. Likelihood and impact are measured on a scale of 1–5, with 1 being extremely low and 5 being extremely high. The likelihood and impact measures are multiplied to establish the overall risk score. Risks with scores between 1 and 6 are given a low risk rating, 7 and 12 a medium risk rating, 13 and 20 a high risk rating, and 21 and 25 an extreme risk rating.

TABLE 14: Data and Technology Risks and Mitigating Actions

RISK	LIKELIHOOD	IMPACT	RISK SCORE	RISK RATING	MITIGATING ACTIONS
Costly technology architecture results in program delays	2	3	6	Low	Program initiatives and projects are prioritized based on ability to achieve outcomes. Resources will be reallocated if required.
Inability to operationalize technology results in an unsustainable program	2	4	8	Medium	As part of the design phase, develop concept of operations for each technology project. Engage operational groups earlier in the project implementation.
Poor data quality results in a lack of meaningful and actionable insights	2	4	8	Medium	Validate data quality as part of the project selection and priority process to determine project feasibility. Establish ongoing monitoring of data quality as part of program monitoring and control.
Data biases result in a lack of meaningful and actionable insights	2	4	8	Medium	When developing project plans, work to incorporate as many datasets as possible while still adhering to all privacy requirements. Design project to encourage open conversations amongst team members and promote fact challenging. Recruit subject matter experts specializing in data theory and ethics.
Proprietary constraints associated with technology result in lack of transferable solutions	2	4	8	Medium	Establish clear requirements regarding future-proofing technologies, importance of replicability and scalability and desire to share advance open source solutions.
Lack of specialized skills (ex. Data Scientists) results in program delays	3	3	9	Medium	Proactive recruitment of advanced technical resources. Build strong partnerships with the post-secondaries and develop a talent pipeline. Where possible, leverage existing agreements already in place (Startup In Residence, Health City, MetroLab Network, etc.).
Inadequate technology solutions result in security or privacy breach	2	5	10	Medium	Processes and standards are in place to ensure the privacy and security of data and information. All members of the Healthy City Ecosystem and anyone working on the implementation of the Healthy City program (including employees and contractors) will be trained on the processes and standards including collection, use and disclosure of information. Develop and maintain an incident management plan.

5.0 GOVERNANCE

5.1 THE HEALTHY CITY PROGRAM GOVERNANCE FRAMEWORK

The City of Edmonton recognizes that an effective governance structure is foundational to the successful delivery of complex programs and the achievement of outcomes. Good governance involves the integration of diverse perspectives for improved decision-making, the ability to prioritize and manage resources effectively, and strong oversight and management of program risks. It is rigorous, transparent and ensures value for money. The City of Edmonton has demonstrated success in establishing governance structures that include both residents and partners through the Open Data and Smart City Advisory Groups, as well as EndPovertyEdmonton and RECOVER.

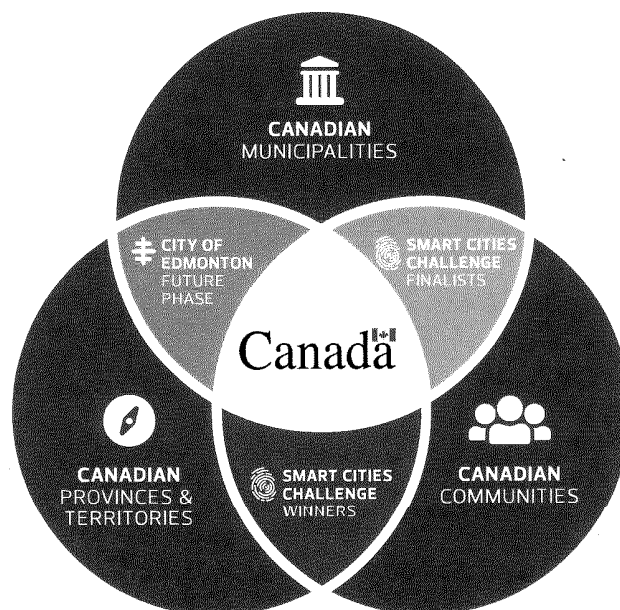
Following City of Edmonton standards, a comprehensive governance framework has been developed to manage the development and implementation of Edmonton's Healthy City program. It ensures the transparent operation of the program and individual projects through a robust governance approach well-suited to a Smart City. This governance framework consists of two integrated layers and a series of supporting foundational principles as described in 5.1.1 and 5.1.2.

5.1.1 CANADIAN COMMUNITIES AND THE GOVERNMENT OF CANADA

As shown in Figure 15, the highest level of governance for the Healthy City program will include the essential partnership between the Government of Canada, the City of Edmonton and other Canadian municipalities, communities and regions.

The City of Edmonton will work to facilitate collaboration and advance the goal of building smarter communities across the country. This will include continual touchpoints with Infrastructure Canada as well as other municipalities, communities and regions in order to build collective capacity for transformative digital innovation that aligns with the goals of the Government of Canada.

FIGURE 15: Federal Government Municipal Connections



5.1.2 HEALTHY CITY PROGRAM GOVERNANCE

The City of Edmonton recognizes that multiple layers of governance do not necessarily improve the quality of technical solutions, the efficiency of delivery or the reduction in risk. As such, the governance structure shown in Figure 16 has been developed to foster collaboration, innovation and the breaking down of barriers that perpetuate organizational and societal silos. This, in turn, will result in more transparency and better decision-making for the Healthy City program.

Detailed descriptions of the governance components shown in Figure 16 are included in Table 15.

Good governance involves the integration of diverse perspectives for improved decision-making, the ability to prioritize and manage resources effectively, and strong oversight and management of program risks.

TABLE 15: Governance Roles and Responsibilities

INDIVIDUAL OR GROUP	DESCRIPTION AND MEMBERSHIP	ROLES AND RESPONSIBILITIES
Executive Leadership Team	<p>As drivers of the strategy and direction for the City of Edmonton, the Executive Leadership Team members champion the transparent and innovative approach to implementation of the Healthy City program.</p> <p>The Executive Leadership Team at the City of Edmonton includes the City Manager as well as all supporting Deputy City Managers.</p>	<ul style="list-style-type: none">• Share the vision for a Healthy City and effectively lead the delivery of that vision.• Accountable to Infrastructure Canada for the City of Edmonton's progress and achievement of outcomes.• Approve membership of the Steering Committee.• Advocate for the program.
Chief Information Officer	<p>The individual responsible for overseeing the program in its entirety.</p>	<ul style="list-style-type: none">• Share the vision for a Healthy City and provide guidance to the Program Team.• Decision-making authority for prioritizing investments for the program and projects.• Approve allotment of resources to specific projects and initiatives and any delegation of authority within the program.• Oversee strategic and operational risk program and ensure appropriate mitigation strategies are in place.• Advocate for the program.
Steering Committee	<p>A committee of internal and external leaders who can advance the strategic vision of the Healthy City program.</p> <p>A combination of up to four community leaders and up to four City of Edmonton Senior Managers representing diverse departments.</p>	<ul style="list-style-type: none">• Share the vision for a Healthy City and provide guidance to the Program Team.• Provide strategic oversight to the advisory groups.• Provide recommendations on projects to be implemented and allotment of resources.• Identify potential program or project risks.• Advocate for the program.

FIGURE 16: Healthy City Program Governance

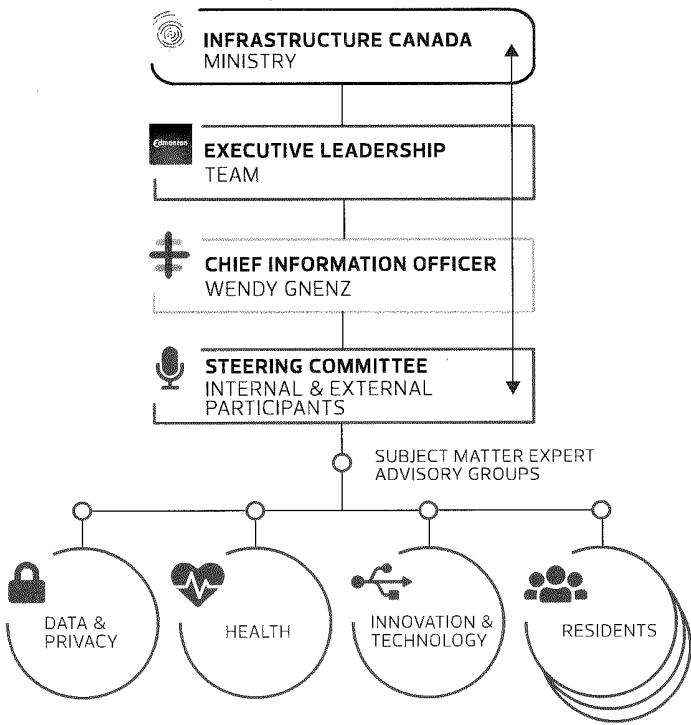


TABLE 15: Governance Roles and Responsibilities (continued)

INDIVIDUAL OR GROUP	DESCRIPTION AND MEMBERSHIP	ROLES AND RESPONSIBILITIES
<p>Data and Privacy Advisory Group</p>	<p>An advisory group of six to eight internal and external subject matter experts in the field of information and data privacy, security and ethics to guide the Healthy City program implementation.</p> <p>Membership will be appointed by the Steering Committee and reviewed on an annual basis.</p>	<ul style="list-style-type: none"> • Share the vision for a Healthy City. • Review and provide feedback on information management and research agreements, data sharing agreements and Privacy Impact Assessments. • Provide recommendations regarding privacy and security to the Steering Committee. • Provide oversight to ensure all privacy and security procedures are as per industry standards and legislative requirements. • Ensure proper procedures are followed in the event of a breach within the program. • Identify and mitigate risks. • Advocate for the program.
<p>Health Expert Advisory Group</p>	<p>An advisory group of up to six internal and external subject matter experts in the field of health (economic, mental, physical and social).</p> <p>Positions will be advertised and individuals interested must submit an application that will be reviewed by the Steering Committee. The Steering Committee will interview individuals from the applicant pool and appoint members.</p> <p>Membership is reviewed by the Steering Committee on an annual basis.</p>	<ul style="list-style-type: none"> • Share the vision for a Healthy City. • Provide advice regarding specific areas of expertise to the Steering Committee and individual project teams on an ongoing or as-needed basis. • Identify privacy and security concerns. • Help identify and mitigate potential program or project risks. • Provide constructive feedback to the Healthy City program. • Advocate for the program.
<p>Innovation and Technology Advisory Group</p>	<p>An advisory group of up to eight internal and external subject matter experts in the field of technology innovation.</p> <p>Positions will be advertised and individuals interested must submit an application that will be reviewed by the Steering Committee. The Steering Committee will interview individuals from the applicant pool and appoint members.</p> <p>Membership is reviewed by the Steering Committee on an annual basis.</p>	<ul style="list-style-type: none"> • Share the vision for a Healthy City. • Provide advice regarding specific areas of expertise to the Steering Committee and individual project teams on an ongoing or as-needed basis. • Help identify privacy and security concerns. • Help identify and mitigate potential program or project risks. • Provide constructive feedback to the Healthy City Program Implementation Team. • Advocate for the program.

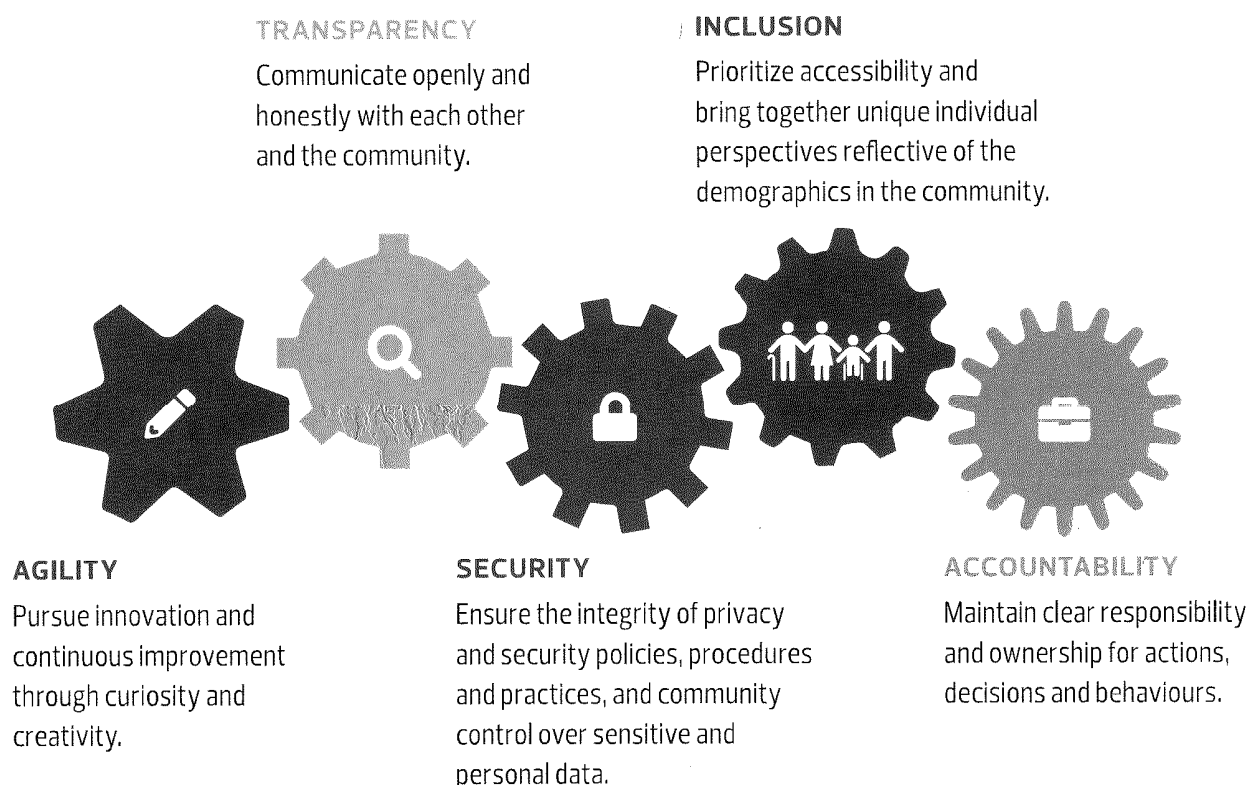
TABLE 15: Governance Roles and Responsibilities (continued)

INDIVIDUAL OR GROUP	DESCRIPTION AND MEMBERSHIP	ROLES AND RESPONSIBILITIES
Residents Advisory Group	<p>An advisory group of up to ten individuals and community leaders, established to share perceptions, provide feedback and ensure the Healthy City program maintains accountability to residents. The group will be representative of community demographics.</p> <p>The advisory group may determine it necessary to establish additional sub-groups with subject matter expertise in specific demographics (i.e. children and youth, seniors, newcomers, Indigenous, etc.) depending on the projects identified and approved for implementation.</p> <p>Positions will be advertised and individuals interested must submit an application that will be reviewed by the Steering Committee. The Steering Committee will interview individuals from the applicant pool and appoint members.</p> <p>Membership is reviewed by the Steering Committee on an annual basis.</p>	<ul style="list-style-type: none"> • Share the vision for a Healthy City. • Ensure residents are engaged throughout all aspects of the program. • Ensure resident feedback is represented in the implementation of programs and projects. • Identify privacy and security concerns from the resident perspective. • Help identify and mitigate potential program or project risks. • Provide constructive feedback to the Healthy City program. • Advocate for the program.

5.1.3 Governance Principles

A series of principles were developed to ensure the governance of the Healthy City program is meaningful, effective and diverse. These principles, shown in Figure 17, will guide the members within the governance structure to ensure public value is not only achieved through implementation, but that it is maximized and reflects the diverse needs of the community.

FIGURE 17: Healthy City Program Governance Principles



The governance of Edmonton's Healthy City program will facilitate the flexible and effective management of the program itself, as well as individual projects and initiatives to ensure long-term success and achievement of goals and outcomes. As a result, the program will be able to adapt quickly to the city's changing needs and environment over the next five years and into the future. The maintaining of a rigorous, yet adaptable, approach to governance moves the City and its partners forward to better embrace innovation with clear accountability, transparency and commitment to maximizing value for the public.

5.2 SMART CITY PARTNERS

The City of Edmonton will drive the growth of the Healthy City program and increase its reach and effectiveness by encouraging strong, open and collaborative partnerships enabled by technology, data and information. These partners play an integral role at every level of the governance of the Healthy City program.

Determining partner readiness is an iterative, dynamic and collaborative process. The assessment of readiness

will begin in concert with partners in the Healthy City Ecosystem to ensure an alignment of vision and outcomes. If the potential partnership has aligned vision and outcomes, it will then be assessed for the necessary capacity and operations required from the partnership. Partner readiness will be assessed on a project-by-project basis as each project will have varying needs. An emphasis will be placed on building capacity amongst the partners in the Healthy City Ecosystem to operate effectively in a dynamic Smart City environment.

Edmonton is well positioned to be successful in effectively integrating partners into the governance and implementation of the Healthy City program. The City has received letters of support from 15 organizations ready to become partners at various stages of program and project implementation. These partners are identified in Table 16, including a description of the organization and a brief overview of the value they bring to the Healthy City Ecosystem. The 15 letters of support are included in the Appendices.

TABLE 16: Healthy City Ecosystem Partners

PARTNER	DESCRIPTION AND VALUE ADD
	<p>Committed to providing wellness solutions that shift the focus from treatment to prevention. This is achieved through innovative solutions that drive behaviour change and foster positive social interactions through an online wellness platform, Balance. Through Balance, Edmontonians are provided with valuable tools and resources that have demonstrated positive improvements in social connections, physical activity levels and sleep quality while also decreasing stress levels, weight and smoking prevalence.</p> <p>Alberta Blue Cross brings health and wellness services expertise to the Healthy City Ecosystem.</p>
	<p>Sets policy and direction to achieve a sustainable and accountable health system to promote and protect the health of Albertans.</p> <p>Alberta Health connects the Healthy City Ecosystem to health policies at the provincial level.</p>
	<p>Canada's first and largest province wide, fully-integrated health system, responsible for delivering health services to the over four million people living in Alberta, as well as to some residents of Saskatchewan, British Columbia and the Northwest Territories.</p> <p>Alberta Health Services brings healthcare expertise and information to the Healthy City Ecosystem.</p>
	<p>An Edmonton-based research lab that pushes the bounds of academic knowledge, guides business understanding of artificial intelligence and machine learning, and is home to some of the world's top talent in machine intelligence.</p> <p>Amii brings expertise in advanced analytics and technology to the Healthy City Ecosystem.</p>

TABLE 16: Healthy City Ecosystem Partners (continued)












PARTNER	DESCRIPTION AND VALUE ADD
<p>Edmonton Community Foundation</p> 	<p>Edmonton Community Foundation strengthens the community by connecting donors to charities and causes that are important to them. Edmonton is full of passionate people dedicated to building a vibrant community. Edmonton Community Foundation supports this by encouraging innovation, visionary thinking and leadership.</p> <p>Edmonton Community Foundation brings extensive community connections to the Healthy City Ecosystem.</p>
<p>Edmonton Public Library</p> 	<p>Edmonton's largest lender of information and entertainment with immense passion for creating connections to help, grow, inspire and change.</p> <p>Edmonton Public Library provides the Healthy City Ecosystem with shared resources and extensive community programs.</p>
<p>Health City</p> 	<p>An economic development initiative that catalyzes, accelerates and connects the health innovation ecosystem in Edmonton and the surrounding region.</p> <p>Health City connects the Healthy City Ecosystem to diverse additional health and wellness partners.</p>
<p>Institute of Health Economics</p> 	<p>An independent, non-profit organization with key competencies in health economics and decision analytic modelling, health technology assessment and knowledge transfer/exchange. Their mission is to inform coordinated, innovative, evidence-guided health policy and practice.</p> <p>The Institute of Health Economics brings expertise in research and analytics to the Healthy City Ecosystem.</p>
<p>MacEwan University</p> 	<p>Provides a transformative education in a collaborative and supportive learning environment where creativity thrives through research and innovation that engage students, faculty and the community. Students can choose from undergraduate degrees, certificates, diplomas and degree-transfer programs.</p> <p>MacEwan University provides the Healthy City Ecosystem with expertise in research.</p>
<p>NorQuest College</p> 	<p>NorQuest College provides learning opportunities for all and equips students with the skills Alberta needs in a supportive and inclusive environment.</p> <p>NorQuest College brings expertise in community learning to the Healthy City Ecosystem.</p>
<p>Primary Care Network (PCN) - Oliver Area</p> 	<p>Team-based primary healthcare delivery in Alberta. PCNs are groups of doctors working collaboratively with teams of healthcare professionals, such as nurses, dietitians and pharmacists, working together to meet primary healthcare needs in their communities.</p> <p>Primary Care Network - Oliver Area brings healthcare expertise and information to the Healthy City Ecosystem.</p>
<p>Sage Seniors Association</p> 	<p>Inspiring and supporting seniors to be the best they can be by providing programs and services that enhance the quality of life of older persons and their families.</p> <p>Sage Seniors Association brings expertise in seniors health and wellness to the Healthy City Ecosystem.</p>
<p>TELUS Health</p> 	<p>Passionate about transforming Canada's healthcare system and dedicated to making better health outcomes possible for all Canadians.</p> <p>TELUS Health brings innovative health and technology opportunities to the Healthy City Ecosystem.</p>

TABLE 16: Healthy City Ecosystem Partners (continued)

PARTNER	DESCRIPTION AND VALUE ADD
<p>United Nations International Organization for Migration (IOM)</p> 	<p>Established in 1951, IOM is the leading inter-governmental organization in the field of migration and works closely with governmental, inter-governmental and non-governmental partners. With 172 member states, a further eight states holding observer status and offices in over 100 countries, IOM is dedicated to promoting humane and orderly migration for the benefit of all. It does so by providing services and advice to governments and migrants.</p> <p>The International Organization for Migration brings expertise to the Healthy City Ecosystem in the areas of international migration law, policy debate and guidance, protection of migrants' rights, migration health and the gender dimension of migration.</p>
<p>University of Alberta (U of A)</p> 	<p>With over 100 years of excellence, the University of Alberta is the province's leading academic and research institution and the fourth leading major medical and research university in Canada. The U of A has a strong focus on building partnerships and innovative collaborations with community health partners.</p> <p>The University of Alberta brings ground-breaking research and innovative health devices and interventions to the Healthy City Ecosystem.</p>

The City of Edmonton is committed to continuing to grow a partnership network that reflects the diversity of the community and the growth of the Healthy City Ecosystem. Insights from the ongoing implementation of the program will proactively identify previously unconsidered partnership opportunities to align with program and project outcomes.

5.2.1 HEALTH CITY

A strategic partner of the Healthy City program is Health City – a non-profit, municipal economic development initiative created to catalyze the health innovation ecosystem in Edmonton and the surrounding region. Health City works with the Healthy City Ecosystem to create a vibrant health industry that achieves health and social outcomes for residents. They support the transformation of innovations from within the health ecosystem into solutions that have commercial application and global relevance. Health City is also attracting talent and capital at both a local and international level – something integral to ensuring the sustainability of the Healthy City Ecosystem and the Healthy City program.

Led by CEO Reg Joseph, Health City will connect the Healthy City program and other partners in the Healthy City Ecosystem to an array of stakeholders from diverse sectors including philanthropic organizations, primary care networks, health and life science academic institutions, workforce training programs, and industry associations and networks. Reg brings 20 years of experience to this role, spanning the biotechnology, high technology and investment sectors, government and industry.

Health City is currently partnering with health practitioners in the community to identify and solve specific health challenges by developing a model that is predictive and wellness-based. One of the key components of the Health City model, that also supports the growth of the Healthy City program, is maximizing the use of data to drive smart decision-making in community health. An example of this is a current project being led by Health City to improve the wellness of seniors in Edmonton. Health City is working with a variety of collaborators including physicians, clinicians, a large multinational life sciences company and two local companies with strengths in artificial intelligence and machine learning to use both clinical data and social indicators to improve the lives of seniors in the community.

Health City has established a series of working groups to ensure the success and vitality of health innovation in Edmonton. The working groups, made up of representatives of the health innovation community, focus on persistent challenges in priority areas identified by stakeholders. These priority areas include better access to markets, training and retaining talent, developing relevant funding models, and leveraging capacity and partnerships in data, artificial intelligence and machine learning to drive health system innovation. Working group members undertake short- and long-term initiatives to build a collaborative and cohesive health innovation community in Edmonton.

5.2.2 ADVANCED ANALYTICS IN EDMONTON

Leveraging the expertise and talents of the local community is integral to the success of the Healthy City program. Edmonton is a thriving hub for data and analytics and home to some of the world's top talent in machine learning. Through organizations such as the Alberta Machine Intelligence Institute (Amii), AltaML and Darkhorse Analytics, the Healthy City Ecosystem will continue to challenge the status quo for data-driven decision-making. These organizations also work to build strong collaborations with global subject matter experts.

5.3 APPROACH TO SENSITIVE AND PERSONAL DATA

The City of Edmonton recognizes the need for community and residents to retain control over sensitive and personal data and for them to understand how this information is being protected. This will occur through the aforementioned Data and Privacy Advisory Group. Working closely with the Office of the Information and Privacy Commissioner of Alberta to understand current trends and concerns, this group will ensure the community is consulted and collaborated with on an ongoing basis regarding data and privacy.

During the implementation of the Healthy City program, there will be no transfer of ownership of information or

data from the primary owner and steward of that data. Information and data may be shared between partners within the Healthy City Ecosystem; however, a formalized data sharing, information management or research agreement must be in place prior to this occurring and a Privacy Impact Assessment complete, if required. In this event, the data is shared, retained and refreshed at the source. This process is explained in further detail in Chapter 7.

5.4 RISKS

Potential risks for governance primarily focus on a lack of diversity, accountability and continuity of members. The City of Edmonton has assessed these and other program risks related to governance and has developed a series of mitigating actions to reduce their impact and likelihood. Governance risks are shown in Table 17. Likelihood and impact are measured on a scale of 1–5, with 1 being extremely low and 5 being extremely high. The likelihood and impact measures are multiplied to establish the overall risk score. Risks with scores between 1 and 6 are given a low risk rating, 7 and 12 a medium risk rating, 13 and 20 a high risk rating, and 21 and 25 an extreme risk rating.

TABLE 17: Governance Risks and Mitigating Actions

RISK	LIKELIHOOD	IMPACT	RISK SCORE	RISK RATING	MITIGATING ACTIONS
Lack of participation and support of internal/external stakeholders results in delays in decision-making	1	4	4	Low	Ensure key stakeholders, residents and partners are engaged in meaningful ways and feel connected to collectively achieve program outcomes. Renew participation commitments at regular intervals.
Governance committee member conflicts of interest result in misaligned program priorities and outcomes	1	5	5	Low	Conflicts of interest will be addressed through the recruitment and selection process of the steering committee and advisory group members. Membership terms are reviewed annually.
Turnover within governance structure results in delays in decision-making	2	3	6	Low	Ensure effective succession planning and documentation to ensure continuity. Teams and terms will be established to minimize high volumes of turnover.

6.0 ENGAGEMENT

6.1 EDMONTON'S APPROACH TO ENGAGEMENT

Public engagement is a critical component of all decision-making, and the City of Edmonton has robust processes and standards to ensure engagement activities are meaningful and accessible. Edmonton is a city that enables and values the participation of residents to define and achieve a better quality of life. The City is committed to seeking diverse opinions, experiences and information through inclusive public engagement practices. Active, engaged Edmontonians make for a more vibrant and connected city as they are contributing to the enhancement of the City's policies, programs, projects and services.

In the fall of 2018, the City of Edmonton won the 2018 International Organization of the Year Award from the International Association for Public Participation. The award was earned due to the collaborative approach taken by the City in building an approach to public engagement with residents. Residents worked in partnership with the City to develop the foundation for the innovative and inclusive public participation practices now commonplace in Edmonton.

6.1.1 EDMONTON'S PUBLIC ENGAGEMENT FRAMEWORK

The City of Edmonton's Public Engagement Framework is part of the City's overall commitment to open government – Edmonton is an open, innovative, inclusive and engaged city. Building such a city takes foresight, planning and active participation by residents. An Open City creates opportunities for diverse input and participation, inviting residents to play a larger role in shaping their community and enabling social and economic growth.

The Public Engagement Spectrum, shown in Figure 18, explains the four roles the public can play when they participate in City of Edmonton public engagement activities. It also indicates the City's purpose for engaging them. As engagement moves within the spectrum, there is an increasing level of public influence and commitment from the City and the public to working collaboratively.

Throughout the implementation of the Healthy City program, residents will participate in roles at every level of the Public Engagement Spectrum; however, the primary focus for residents will be in the spaces of Advise, Refine

and Create depending on the stage of the program or specific project requirements.

6.1.2 Applying the Public Engagement Framework

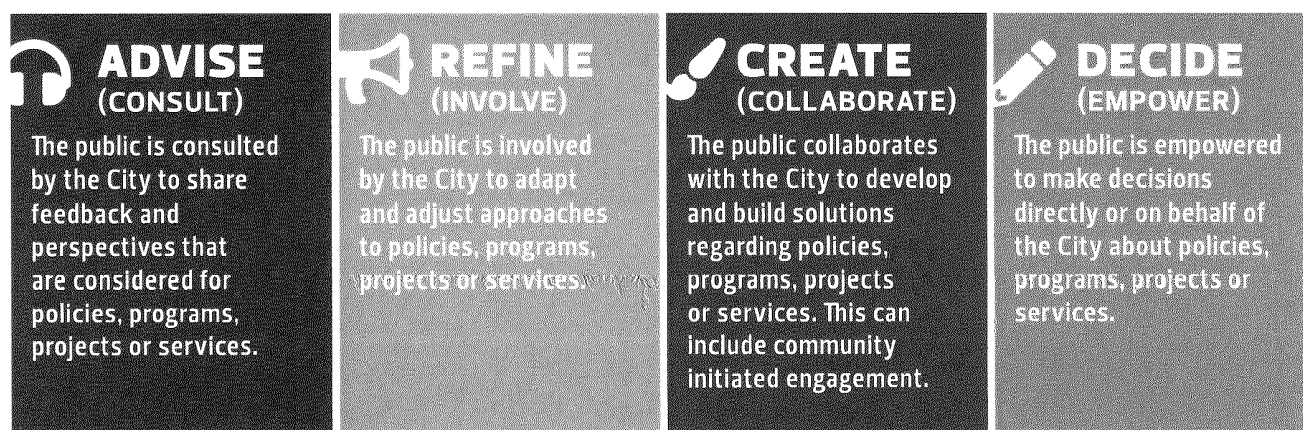
The City of Edmonton, by applying diverse methods of engagement throughout the implementation of the Healthy City program, will continue to ensure ongoing alignment between the program's outcomes and the concerns and needs of residents and stakeholders.

As projects are identified, engagement plans will be built in collaboration with residents and partners. This will allow for residents and partners to shape the activities to best suit the outcome of the project and to apply learnings from previous engagement activities. A component of the engagement plan for each project will include a change management approach – the steps that will be taken to gain acceptance and onboard residents and stakeholders throughout the project implementation and beyond. It will also include a comprehensive communications plan that identifies how residents and stakeholders will be informed of how their input influenced the development, implementation and sustainability of the project.

Whenever possible, the City will work internally to identify opportunities to collaborate on engagement activities with other projects and programs that seek similar outcomes, so as not to overwhelm residents and stakeholders with multiple activities or events on very similar topics. The City will also work with partners to identify other similar opportunities for collaborative engagement activities.

FIGURE 18: Public Engagement Spectrum

INCREASING INFLUENCE & COMMITMENT



COMMUNICATIONS INFORM, LISTEN & LEARN

PROJECT MANAGEMENT – DECISION MAKING – RELATIONSHIPS – CAPACITY BUILDING – LEADERSHIP DEVELOPMENT

6.2 ENGAGEMENT THAT SHAPED EDMONTON'S FINAL PROPOSAL

The development of Edmonton's Smart Cities Challenge Proposal was informed by 16 months of intense, focused engagement with stakeholders to understand what makes Edmonton a Smart and Healthy City. This specific engagement built upon 11 years of previous engagement that shaped Edmonton's 2009–2018 Strategic Plan and its subsequent initiatives, as well as the recent work that was done with the community to revise the plan for 2019–2028.

- In 2007 and 2008, extensive public engagement shaped Edmontonians' common vision for their community's future as articulated in The Way Ahead, the City of Edmonton's Strategic Plan.
- In 2010 and 2011, a livability plan (The Way We Live) was developed through consultation with Indigenous people, seniors, people with disabilities, and youth.
- In 2015, EndPoverty Edmonton engaged more than 3,000 Edmontonians to identify how poverty could be ended in a generation. Outreach activities focused on Indigenous people, newcomers, young and old, and the organizations that support these individuals.
- In 2016 and 2017, consultation with businesses, community leagues, recent immigrants and refugees, school boards, cultural community leaders (Indigenous, Métis, Muslim and Somali communities), the homeless and those who work

with them, and sufferers of mental health and addictions informed the development of an Urban Wellness Plan, RECOVER.

- Between January and March 2018, over 85 community leaders and 8,000 residents helped refine and advise Council on the vision, principles and strategic goals that will help make Edmonton a more innovative, resilient, inclusive, connected and healthy city.

As the City continues to grow and evolve, Edmonton's Strategic Plan is being revised, ensuring that the long-term needs of residents are well articulated and guiding everything the City does. The City works with the community to ensure engagements are inclusive, accessible and outcome-driven.

6.2.1 Smart City Engagement Results

Edmonton's initial Smart Cities Challenge application was informed by a year of comprehensive, focused engagement with stakeholders. During that time, the City heard that:

- Residents want to transform how municipal services are delivered.
- Residents want to become healthier and be more engaged in their communities.
- Residents desire to create a sense of connectedness that empowers them to support each other.

This public engagement also identified certain barriers to achieving the above, including:

- **Urban Sprawl:** Physical isolation has contributed to social isolation, poor access to healthy food choices and increased incidence of chronic disease.
- **Winter City:** A challenging winter climate complicates achieving a year-round active lifestyle and accessing services, especially for newcomers from warmer climates.
- **Social Support Structures:** Some segments of Edmonton's population, newcomers to Edmonton in particular, lack family, language, cultural supports and the awareness of the services available to assist them.
- **Health Awareness:** Individuals may not be aware of changes in the health and social conditions that impact their lives. Due to community disconnection, individuals at risk may not be identified.
- **Access to Services:** Health and social services can operate in a disparate fashion, making it challenging for residents to access the right care, at the right time, at the right place, by the right provider, with the right information. Services also are not delivered in a way that acknowledges the unique needs of language and culture.

Building upon what was heard in the initial round of engagement, the City wanted to learn more about what makes residents feel connected and how their technology use may increase or decrease their connections.

This engagement identified five common themes related to increasing connectedness:

- Establishing a sense of community through accessible events, festivals, activities and spaces
- Connecting to nature through Edmonton's river valley and green spaces
- Moving around the city using various modes of transportation
- Embracing and celebrating the diversity of residents.
- Enhancing public safety

It also highlighted the following about technology use:

- The two biggest barriers to using technology devices for surveyed participants were cost and concern for the safety of personal information.
- Eighty-eight per cent of surveyed respondents indicated they used a smartphone multiple times a day for anything from arranging transportation and completing errands to communicating with family and friends and ensuring personal safety.
- Ninety-nine per cent of survey respondents indicated they had access to Wi-Fi in their homes.

The above engagement results will be shared back to the community through a What We Heard Report to be released in March 2019. This will provide residents and stakeholders an overview of how their stories and ideas shaped the final vision and plan for the Healthy City program.

FIGURE 19: Engagement Tools

 INFORM	 GENERATE & OBTAIN INPUT	 GAIN ACCEPTANCE & ONBOARD
<ul style="list-style-type: none"> • Electronic Signs • Information Booths at Events • Open Data Portal • Printed Items (brochures, postcards, handouts, advertising) • Public Meetings • Social Media • Sponsorship • Website 	<ul style="list-style-type: none"> • Contests and Competitions • Ethnographic Research • Focus Groups • Interviews • Surveys • Workshops (human-centred design, appreciative inquiry) • World Cafes 	<ul style="list-style-type: none"> • Advisory Groups • Community Asset Mapping • Consensus Workshops • Training Programs • Working Groups

6.3 ENGAGEMENT TOOLS: PAST, PLANNED AND FUTURE

Building relationships with diverse communities through public engagement is a priority for the City of Edmonton. In collaboration with residents, community leaders and service providers, the City develops engagement activities to best suit the needs of residents and makes use of a diverse array of engagement tools to ensure a meaningful connection with residents and stakeholders. These tools can be adapted to target different population groups in order to encourage high participation. A sample of these tools is provided in Figure 19.

6.3.1 Engagement to Build Edmonton's Smart Cities Challenge Final Proposal

The City of Edmonton is committed to ensuring the diversity of the City is reflected in its engagement approach. To provide transparency to the development of this approach and encourage participation, the City:

- Advertised in print media and through posters in libraries, community centres, social agencies, safe houses and shelters.
- Used Twitter and Facebook to update progress and solicit ideas.
- Gathered 260 distinct viewpoints from more than 1,000 individuals in the newcomer, Indigenous, low income, homeless, vulnerable youth, seniors, and LGBTQ2S+ communities through communication vehicles reflecting their preferences, including in-person workshops, interviews and paper and electronic surveys.

Figure 20 provides a summary of the activities completed between July 2018 and February 2019 in which residents and stakeholders shared their stories and ideas to help finalize the vision and approach for Edmonton's Healthy City program.

FIGURE 20: Engagement Activities



IN-PERSON EVENTS

- Attended **8 community-led events** and spoke with over **3,100 residents**.
- Hosted **3 pop-up engagement events** in community centres and libraries and met with over **100 residents**.
- Hosted **5 focus groups** (including an LGBTQ2S+ and Indigenous-specific focus groups) with **52 participants**.
- Presented at **3 workshops** attended by over **300 service providers** to learn about their perspectives on building a healthier, more connected City.
- Sponsored HackED, Alberta's largest student-run hackathon with **450 participants**.



DIGITAL STORYTELLING

- Developed a video series featuring **10 community leaders** to inspire residents to share their stories. **361 residents** shared their story. **Videos were viewed 128,912 times** on Facebook and YouTube.
- Engaged with over **650 children and youth** from Edmonton's City Hall School.
- Reached over **725 residents** through a telephone survey.
- Received over **580 Twitter post engagements** (likes, mentions and retweets).
- Received over **3,800 Facebook post engagements** (likes, comments, shares and clicks).
- Hosted a technology survey through the Edmonton Insight Community. The survey received **1,020 responses**.

In addition, to help formulate the strategy for inclusive engagement under the implementation of the Healthy City program, the City of Edmonton worked with the non-profit and academic sectors to learn about meaningful engagement activities for newcomers to Canada, the urban Indigenous population, seniors, children and youth, and those with experience living in poverty and homelessness. The City also met with subject matter experts in the non-profit sector, government and academia to discuss opportunities for future collaborations on engagement activities and potential partnership opportunities within the Healthy City Ecosystem.

6.3.2 Engagement Activities Planned for the Healthy City Program

The Healthy City program will embed residents and stakeholders in all elements of implementation from problem identification and solution generation to testing tools and scaling technologies.

The activities listed below will ensure the approach to implementing the Healthy City program continues to reflect the true needs and perspectives of Edmontonians. These activities will support ongoing program development and implementation as well as form the basis for project-specific engagement plans to be built in partnership with the community.

- Activity-specific campaigns to engage target audiences on concepts such as data privacy and security and use of technology devices.
- Demographic-specific engagement activities including workshops with diverse communities, storytelling circles, presentations, focus groups and surveys.
- Online engagement through the Edmonton Smart Cities website, Twitter and Facebook.
- Annual workshops with networks of service providers.
- Annual surveys through network of community leagues.
- Quarterly surveys hosted through the Edmonton Insight Community.
- Quarterly tech/data-oriented meetups with the local civic technology community.

- Biannual hackathons on National Civic Hacking Day and International Open Data Day.
- Participating in technology training sessions with community organizations.
- Maintaining a strong network of community leaders who will encourage diverse resident participation in engagement activities.
- Sponsoring civic tech community programs that highlight the use of open data for solving community challenges.
- Ensuring accessibility of engagement activities through proactive planning and guidance from Edmonton's Accessibility Advisory Committee.

Residents and service providers will be invited to provide ongoing input into the development and expansion of engagement activities as the implementation of the Healthy City program progresses. The City will continue to engage with residents using approaches that are meaningful to them to facilitate and encourage broad participation so that Edmonton continues to be a community in which residents lead the development of the City's long-term strategic priorities.

6.4 INCLUSIVE ENGAGEMENT

The City of Edmonton is committed to ensuring all residents have the opportunity to participate in civic life. This is demonstrated through [Edmonton's Diversity and Inclusion Framework](#) and the work being done by the City to fully implement a Gender-Based Analysis Plus (GBA+) program to guide the development of policies, programs and services. This framework exists to ensure that the City recognizes Edmonton's growing diversity and that all Edmontonians have the opportunity to fully participate in the programs and services that the City provides. As a representative body and service provider, the City must find a way to serve all residents in a manner that meets their expectations and fosters full contribution by all members of the community.

The City of Edmonton is committed to ensuring all residents have the opportunity to participate in civic life.

All engagement activities and plans for the implementation of the Healthy City program will be developed by applying a diversity and inclusion lens through consultation with subject matter experts, community leaders and service providers. As the program evolves and projects grow, engagement processes will be modified based on feedback from the community to ensure they remain relevant and reflective of the diverse needs and aspirations of residents.

In order to mitigate the potential for unintentional effects or bias towards certain population groups to arise as a result of engagement, the City will work with community leaders to understand the diverse needs of individual groups and design plans and activities collaboratively. The City will ensure the community retains ownership over the information gathered throughout the engagement process and remains informed as to how the information is being used to inform, enhance or build projects.

6.5 EXPERIENCED OR EXPECTED RESIDENT REACTIONS

The City of Edmonton recognizes the importance of effective training for employees responsible for leading public engagement. Through training and practice, employees develop the skills to manage diverse reactions from residents and stakeholders as well as mitigate and manage any issues that arise. The courses available to City of Edmonton employees are certified through the International Association for Public Participation and include:

- Foundations in Public Participation
- Strategies for Dealing with Opposition and Outrage in Public Participation
- IAP2 Certificate in Public Participation
- Public Participation for Decision-Makers

Some of the challenges that may be faced during public engagement activities include cynicism and distrust towards the organization, lack of time to participate and lack of awareness of the program. The City of Edmonton works to reduce these barriers to positive public participation by taking the time to intentionally plan engagement with residents and stakeholders in a meaningful way, having a strong understanding of

community issues, needs and local support networks, and approaching projects and planning efforts in collaboration with the community.

Throughout the course of the public engagement activities for the Smart Cities Challenge, the City of Edmonton received overwhelmingly positive responses from residents, service providers, academic institutions and the private sector regarding the pursuit of building a smarter, healthier and more connected city. The City of Edmonton worked in collaboration with service providers and other programs and initiatives at the City to develop engagement activities that were meaningful and would not duplicate previous or ongoing engagement in order to avoid engagement fatigue.

Throughout the course of the public engagement activities for the Smart Cities Challenge, the City of Edmonton received overwhelmingly positive responses from residents, service providers, academic institutions and the private sector regarding the pursuit of building a smarter, healthier and more connected city.

6.6 RISKS

Engagement is a critical component of the Healthy City Program. A number of potential risks have been identified that require mitigation and monitoring on a continual basis, including engagement fatigue resulting in low participation and being unable to engage meaningfully with underrepresented or vulnerable populations. The City of Edmonton has assessed these and other program risks related to engagement and has developed a series of mitigating actions to reduce their impact and likelihood. Engagement risks are shown in Table 18. Likelihood and impact are measured on a scale of 1–5, with 1 being extremely low and 5 being extremely high. The likelihood and impact measures are multiplied to establish the overall risk score. Risks with scores between 1 and 6 are given a low risk rating, 7 and 12 a medium risk rating, 13 and 20 a high risk rating, and 21 and 25 an extreme risk rating.

TABLE 18: Engagement Risks and Mitigating Actions

RISK	LIKELIHOOD	IMPACT	RISK SCORE	RISK RATING	MITIGATING ACTIONS
Resident perception is impacted by national and international media stories resulting in lack of trust in local program	2	3	6	Low	Ensure that key messages are in place to articulate the value of the program and tangible activities and outcomes. Describe that the fundamental nature of the program recognizes the importance of a progressive and evolutionary approach when it comes to data and technology. Transparency exists in reporting back to community on an ongoing basis.
Lack of diverse resident participation results in skewed engagement results	2	4	8	Medium	Ensure residents are engaged in diverse and meaningful ways. Develop specific engagement approaches to target diverse demographics. Evaluate success of diverse engagement activities in order to continuously improve.
Stakeholder groups not identified and engaged early in the program results in projects not achieving outcomes	2	4	8	Medium	Ongoing stakeholder analysis will take place encouraging diverse participation from initial stages of program implementation. With the growth of the Healthy City Ecosystem, the program's ability to reach additional stakeholders and partners will increase.
Engagement fatigue results in lack of resident participation	3	3	9	Medium	Work in collaboration with service providers and other programs and initiatives at the City to develop engagement activities that are meaningful and do not duplicate previous or ongoing engagement.
Conflicting priorities among stakeholder groups results in delays in program implementation	3	3	9	Medium	Ensure outcomes for program and projects are clear. Develop key messages for working with stakeholders to communicate vision and outcomes.
Diverse populations are underrepresented in engagement efforts resulting in biases	3	4	12	Medium	Engage community leaders and subject matter experts to gain insight on best practices on how to include and engage underrepresented populations in a meaningful way. This includes recognizing that methods of engagement can take many forms.

7.0 DATA PRIVACY, SECURITY AND ETHICS

7.1 DATA MANAGEMENT PLAN

The quality, reliability and integrity of information are critical to effective decision-making at the City of Edmonton. As an Open City, Edmonton is working to build new ways to share information with residents, find new opportunities for dialogue and make programs and services easier to access. The City is committed to ensuring compliance with privacy and security standards for obtaining and using data as well as having mitigating controls in place to minimize risk. In addition, the City not only ensures compliance with controls, but also prioritizes the ethical use of data.

The following sections outline how data is governed at the City of Edmonton and provide the framework for how data will be managed throughout the implementation of the Healthy City program.

7.1.1 DATA GOVERNANCE AT THE CITY OF EDMONTON

Data governance is a fundamental pillar in the success of digital transformation. The City is a recognized leader in the use of data as a strategic asset and, from the award-winning Open Data Portal to the innovative work in the Analytics Centre of Excellence, Edmonton has set the bar for municipal data governance considerably high.

In recognition of these efforts, Edmonton was selected as the first Canadian pilot city for the What Works Cities Initiative, a program delivered by the Center for Government Excellence (GovEx) at Johns Hopkins University. As a result of this partnership with What Works Cities, the City of Edmonton developed a comprehensive [Data Governance Roadmap](#) to guide the work that will enhance the City's ability to treat data as a strategic asset and lay the foundation for advanced data practices. This roadmap lists major milestones and associated deliverables, the majority of which are underway by a team of individuals dedicated to improving data management practices across the organization. This includes work in the areas of data quality and standards, prioritization for release, privacy and security and data retention.

Edmonton's progressive data governance practices continue to support the advancement of the City's open government initiative and leadership as a Smart City.

7.1.2 EDMONTON'S OPEN CITY INITIATIVE

An Open City is a connected city. Edmonton is building an open and connected city, in which residents have the opportunity to collaboratively design, develop and deliver innovative, inclusive and efficient public programs, services and policies.

The City's Open Data Portal was launched in 2010 and was followed by the Open City Initiative – a municipal perspective on the philosophy of open government – in June of 2014. The Open City Initiative guided the development of the Open City Policy which was adopted by Edmonton's City Council on April 14, 2015. Since that time, the City has continued to progress in its open government journey.

The basis of the City's award-winning Open Data Portal and other Open City projects is that the City's information is a public asset – consistent with privacy legislation, it exists readily in a portal that Edmontonians can easily find and use in ways that will help improve their quality of life.

The City has established an Open Data Advisory Group with representatives from diverse business areas, including privacy advisors, legal advisors and data stewards. The City has also established an Open Data Citizen Advisory Group where residents are engaged to provide their ongoing feedback and ideas. As an operational body, the Open Data Advisory Group also manages the open data lifecycle through robust data quality review and release mechanisms. In addition, Edmonton's Open Data program established the Smart City Steering Committee with executive representation from across the City of Edmonton. The Committee oversees and supports the Open Data program as it achieves its goals and vision. By providing leadership

support to the Open Data program, the Committee ensures value realization through an annual performance audit.

7.1.3 HEALTHY CITY PROGRAM DATA MANAGEMENT

To accommodate the phased development of the Healthy City program and individual projects, privacy and security are being approached through an ongoing, cyclical process. When new projects are identified or a change in direction of an existing project or initiative is deemed necessary, the project will be evaluated for privacy and security implications prior to any action being taken. Privacy and security will be considered throughout the lifecycle of all projects and any new ideas, data or changes in approach will be analyzed through a standard privacy and security assessment. Ongoing reviews of existing projects and initiatives will ensure the Healthy City program is continuously meeting the privacy and security needs of residents and partners in the Healthy City Ecosystem.

Through all phases of the Healthy City program, the implementation team will work directly with the Information Security Office of the City of Edmonton and Edmonton's Corporate Information Security Officer to maintain the privacy and security of all information shared through the Healthy City Ecosystem. Privacy Impact Assessments will be submitted to the Office of the Information and Privacy Commissioner of Alberta (OIPC) through the Office of the City Clerk at the City of Edmonton. Additionally, information and research agreements, as well as data sharing agreements, will be completed and managed for compliance.

All violations or suspected violations of privacy and security will be reported in accordance with governing legislation. Following the City of Edmonton's Privacy Breach Management process, such notifications of violations or suspected violations will result in steps to limit the breach, a Privacy Breach Report and determining which authorities or organization need to be informed. Affected employees and partners will be involved and consulted. Notification of affected parties will occur based on potential risk and impact.

7.2 PRELIMINARY PRIVACY IMPACT ASSESSMENT

The purpose of Edmonton's Preliminary Privacy Impact Assessment was to examine the privacy, confidentiality and security risks associated with the first phase of the Healthy City program. It was developed through the Office of the City Clerk at the City of Edmonton and in consultation with the Office of the Information and Privacy Commissioner of Alberta prior to submitting to the OIPC on January 31, 2019. Additionally, the City of Edmonton's Smart Cities Challenge Team participated in a roundtable hosted by the OIPC in Edmonton and Calgary for communities across Alberta. During this roundtable, Edmonton presented the approach to managing privacy and security as part of the Healthy City program.

In order to develop Edmonton's Smart Cities Challenge proposal, the City has not collected, used nor disclosed any personal or health information or data. Rather, a Preliminary Privacy Impact Assessment was developed to provide background to the proposed usage of information to show that the City of Edmonton is undertaking reasonable steps to maintain administrative, technical and physical safeguards to protect the confidentiality of the information under the City's custody and control. Edmonton is required to protect the personal and health information in their custody or control against reasonably anticipated threats or hazards that could result in loss, unauthorized disclosure or use, modification or inaccuracy.

In phases two and three of the Healthy City program, it is proposed that information and data will be collected and shared between partners in the Healthy City Ecosystem for use on specific projects. This will assist with identifying gaps in services and outlining potential changes to policies and programs that would increase the quality of life for residents. As the Healthy City program enters these phases of development, further Privacy Impact Assessments will be submitted based on legislative requirements and potential personal or health information gathered. Future phases may include the sharing of Alberta Health or Alberta Health Services data. As such, the City is cognizant of Section 64 of Alberta's Health Information Act.

Edmonton's Preliminary Privacy Impact Assessment documents reasonably anticipated threats or hazards and the suitable safeguards put in place by the City of Edmonton to manage those threats and hazards in the proposed program. It includes a review of the 10 privacy principles set out in the Canadian Standards Association's Model Code for the Protection of Personal Information as they apply to data sharing within the Healthy City Ecosystem.

The City of Edmonton understands the responsibility of ensuring the privacy and security of personal and health information and ensures that appropriate privacy and security measures are in place. The information that will be collected, used and disclosed will be securely protected end-to-end. As the program grows or changes, plans for additional projects or initiatives will be assessed and for those that require an updated Privacy Impact Assessment, one will be completed.

As this program will be implemented using a phased approach, with variables as to its future state and potential datasets, this Preliminary Privacy Impact Assessment was designed to ensure the privacy and security of phase one and that all datasets shared, used and disclosed are identified and secure.

7.3 COMPLIANCE WITH MUNICIPAL, PROVINCIAL AND FEDERAL PRIVACY REGIMES

The City is committed to ensuring compliance with privacy and security standards for obtaining and using data as well as having mitigating controls in place to minimize risk. The following sections outline the municipal, provincial and federal privacy regimes that will govern the Healthy City program.

7.3.1 CITY OF EDMONTON

City Policies are Council statements that set standards of performance for the City as a whole, and guidelines for the manner in which public City initiatives and activities will be carried out. Administrative Directives and Procedures are instructions that City employees must adhere to when performing their duties on behalf of the City. They are inward-facing in that they guide the behaviours of internal staff. The City Policies and Administrative Directives included in Table 19 are the foundation for management of data within the Healthy City program. They are available publicly through the City of Edmonton's website.

TABLE 19: City of Edmonton Policies, Administrative Directives and Procedures

NAME	PURPOSE	APPLICATION TO PROGRAM
<u>Policy C538 – Diversity and Inclusion</u>	Expresses the City of Edmonton's values respecting diversity and inclusion and to ensure the City's unwavering commitment to cultural, economic, social and political excellence.	The Healthy City program values the input, knowledge and background that makes Edmonton an effective place to live, work and play.
<u>Policy C581 – Open City</u>	Articulates the City's commitment to bring to action the Open City principles of collaboration, inclusiveness, innovation, participation and transparency.	The Healthy City program will create opportunity for diverse input and participation, inviting Edmontonians to play a larger role in shaping the community and enabling social and economic growth.
<u>Policy C587 – Enterprise Risk Management</u>	Establishes framework for the City to mitigate risk while conducting City business.	The Healthy City program has structured risk management in accordance with the Enterprise Risk Management policy.
<u>Policy C593 – Public Engagement</u>	Creates opportunities for residents to contribute to decision-making by City Council and Administration about the City's policies, programs, projects and services, and communicates how public input is collected and used.	Effective and inclusive public engagement is critical to the success of the Healthy City program.
<u>Administrative Directive A1100C – Employee Code of Conduct</u>	Establishes principles for appropriate employee conduct in the workplace.	This Administrative Directive is the cornerstone of workplace behaviour including understanding of acceptable use of City assets and information.

TABLE 19: City of Edmonton Policies, Administrative Directives and Procedures (continued)

NAME	PURPOSE	APPLICATION TO PROGRAM
<u>Administrative Directive A1205A – Contract Management Directive</u>	Establishes guiding principles, procedures and processes that ensure the City follows best practices when procuring goods, services and construction.	For effective delivery of the Healthy City program, there will be procurement contracts or agreements required for partnerships.
<u>Administrative Directive A1429D – Acceptable Use of Communication Technology</u>	Establishes standards and guidelines for employees and other users when transmitting, storing and accessing communication technology, in accordance with the Code of Conduct. This directive clarifies responsibility and establishes guidelines for employees to protect mobile data storage from loss or theft, including protecting any sensitive data which might be stored there.	Various forms of communication will be utilized throughout the implementation of the Healthy City program.
<u>Administrative Directive A1433A – Privacy</u>	Ensures that the City complies with the privacy provisions of the Freedom of Information and Protection of Privacy Act (FOIP) and commits itself to the protection of all recorded personal information about an identifiable individual. This directive reflects the collection, use and disclosure of information to ensure compliance with other legislation as required.	The Healthy City program will ensure the collection, use and disclosure of information is compliant with all legislation.
<u>Administrative Directive A1445 – Privacy Breach</u>	This directive establishes guidelines for the management of inadvertent disclosure of personal information by assisting employees in the reporting, investigating and documenting of privacy breaches and determining the severity of the privacy breach.	Mandatory breach reporting under various legislations makes this directive essential for the Healthy City program as proper processes, procedures and policies are in place with clear direction in case of a breach.
<u>Administrative Directive A1457 – Information Technology Investment and Architecture</u>	Clarifies responsibility and establishes procedures for information and technology investment and architecture of all business systems, information, applications, technology and/or processes.	The successful delivery of the Healthy City program requires effective investments in technology.
<u>Administrative Directive A1461 – Information Management</u>	Prescribes the standards for all employees handling City information and articulates the information management principles to be applied when creating new processes or standards related to information management.	Strong information management is critical to the privacy and security of the Healthy City program, along with a strong information management standard.
<u>Access Control Technical Standard</u>	Identifies the requirements to ensure that access controls will be identified, implemented and managed appropriately for systems. Access control restrictions on systems mitigate the risk of security threats such as internal and external intrusions.	The Healthy City program requires robust access controls in place to manage and mitigate any potential security threats.
<u>Asset Management Technical Standard</u>	Identifies the asset management requirements for the management of information technology systems and the classification of information processed through those systems.	To run a successful program, asset management is critical to ascertain needs, requirements and classifications of information being processed.
<u>Business Continuity Management Technical Standard</u>	Identifies the requirement to include cyber security requirements in the planning for the continuance services where a human-induced or natural disaster has occurred.	Business continuity is essential to any program and in the unlikely event of an incident, business continuity plans will be implemented to ensure no loss of information and protection of the assets and information.

TABLE 19: City of Edmonton Policies, Administrative Directives and Procedures (continued)

NAME	PURPOSE	APPLICATION TO PROGRAM
<u>Communications and Operations Management Technical Standard</u>	Identifies the requirements to ensure that communications and operations functions of systems are identified, implemented and managed following a set of baseline security requirements.	Processes are in place to ensure communications and operations of systems are consistent with industry standards or best practices.
<u>Cyber Security Incident Management Technical Standard</u>	Identifies the requirement to ensure that cyber security incident management processes are established. The process will enable the City to identify, assess, manage, mitigate and accurately communicate facts of cyber security incidents.	Processes are in place to manage and mitigate any possible cyber attack.
<u>Information Technology Systems Acquisition, Development and Maintenance Technical Standard</u>	Establishes requirements and controls for managing the lifecycle of information technology systems ensuring that security requirements are identified early on as part of the business needs, and ensures that information technology acquisition takes into account information protection.	Information Technology is a key component of the Healthy City program, including effective acquisition, development and ongoing maintenance.
<u>Physical and Environmental Security Technical Standard</u>	Articulates the requirements to identify and manage physical and environmental threats against technology systems and the premises where those systems reside.	The technical standard for security from a physical and environmental standpoint is required to meet the privacy and security requirements of the Healthy City program.

7.3.2 PROVINCIAL

The City of Edmonton is aware of the following provincial legislations and has developed processes to ensure adherence as outlined in Table 20.

TABLE 20: Provincial Legislations

NAME	PURPOSE	APPLICATION TO PROGRAM
<u>Personal Information Protection Act (PIPA)</u>	Provides individuals with the right to request access to their own personal information while providing private sector organizations with a framework for conducting the collection, use and disclosure of personal information.	Alberta's PIPA legislation has been in effect since 2004 and guides the collection, use and disclosure of personal information. While PIPA is Alberta-based, the privacy principles are similar to the Personal Information Protection and Electronic Documents Act and when developing any datasets or information, the goal is that privacy requirements are usable and transferable across Canada.
<u>Health Information Act (HIA)</u>	Sets out the rules for the collection, use, disclosure and protection of health information that is in the custody or under the control of a custodian. Custodians include Alberta Health, Alberta Health Services, physicians, pharmacists, etc.	Alberta based legislation that may impact future phases of the Healthy City program. The Health Information Act of Alberta manages the collection, use and disclosure of health information and includes mandatory breach reporting.
<u>Freedom of Information and Protection of Privacy Act (FOIP)</u>	Governs public bodies, including municipalities, universities, school boards, etc., and controls the manner in which a public body may collect personal information from individuals, to control the use that a public body may make of that information and to control the disclosure by a public body of that information.	The City of Edmonton complies with Alberta's FOIP Act.

7.3.3 FEDERAL

The City of Edmonton is aware of the following federal legislations and has developed processes to ensure adherence as outlined in Table 21.

TABLE 21: Federal Legislations

NAME	PURPOSE	APPLICATION TO PROGRAM
<u>Personal Information Protection and Electronic Documents Act (PIPEDA)</u>	Governs how private sector organizations collect, use and disclose personal information in the course of commercial business.	Federally, PIPEDA legislation oversees the protection of electronic documents, as well as personal information protection. In Alberta, compliance with PIPA is also required. As both have similar privacy principles, along with mandatory breach reporting, adhering to both Acts provides a guarantee of effectively managing the information collected, used and disclosed by the Healthy City program.

7.4 DATA LIFECYCLE MANAGEMENT

As the Healthy City program evolves and new projects are identified, the data required to implement them will be identified and steps will be taken to source and manage it appropriately. Table 22 details how the data lifecycle will be addressed in the Healthy City program.

TABLE 22: Data Lifecycle Management

DATA LIFECYCLE MANAGEMENT	DETAIL
Data Collection	In phase one, the Healthy City program will work with open data from the City of Edmonton as well as external open datasets. As the program evolves, the sharing of datasets between partners within the Healthy City Ecosystem will occur, requiring formalized agreements and the completion of additional Privacy Impact Assessments. In order for this data to be utilized in these phases, it must be anonymized, with the rules around collection being limited to groups over 20 (any number less than 20 is eliminated) or first three digits of postal code (GIS locator), which limits information to a group of 38-40 houses.
Data Generation	Methods for data generation include interviews, questionnaires, surveys, observations, focus groups, ethnographies, oral history, case studies, documents, records and statistical information.
Data Analysis	Data analysis will be paired with community consultation throughout the entirety of the implementation of the Healthy City program and is not a stand alone activity. Examples of this data analysis could include data clustering, matching, mining and advanced analytics.
Data Storage	Data generated publicly through the Healthy City Ecosystem and for use in Healthy City projects will remain a public asset as defined under the City's Open Data Strategy. Whenever possible and appropriate, newly generated data will be shared through the City of Edmonton's Open Data Portal which allows for community access and the potential for locally-based solutions to be developed.
Data Transmission	Data will only be transmitted utilizing appropriate secure and private transmission methods.
Plans for Reuse	Under the data sharing approach described in Chapter 4, data will not be available for reuse. The only data available for reuse will be the datasets available in the Open Data Portal.
Plans for Redistribution	Under the data sharing approach described in Chapter 4, data will not be available for redistribution.
Data Archiving and Preservation	Data managed by the City of Edmonton will be archived and preserved according to organizational standards and is dependent on the type of data. The City of Edmonton will not archive or preserve data made available to the organization through data sharing, information management or research agreements. These agreements will outline the return or disposal of shared data.

7.5 SECURITY, PRIVACY AND ETHICS CONSIDERATIONS

Ongoing efforts will be made to integrate security and privacy considerations raised by users, residents and partners throughout the phased implementation of the Healthy City program. Individual project plans will have a privacy and security component that will be developed through ongoing consultation with residents and stakeholders to ensure their expectations are met and to further the collective understanding of ethical privacy and security measures.

The Healthy City program will also focus on assessing the ethical considerations that go beyond current legislation related to data usage and analytics. A comprehensive ethical assessment framework will be developed using the Information Accountability Foundation's [Essential Elements of Accountability](#), the United Nations Global Pulse [Risks, Harm and Benefits Assessment Tool](#) and the Open Data Charter 2019 Strategy: [Bringing Power into the Open](#). The Office of the Information and Privacy Commissioner of Alberta will assist the Healthy City program in assessing ethical considerations as the program progresses, including potential impact on social and environmental ecosystems.

7.6 ADHERENCE TO DATA AND PRIVACY PRINCIPLES

Table 23 outlines how the City of Edmonton will adhere to the following data and privacy principles.

TABLE 23: Adherence to Data and Privacy Principles

PRINCIPLES	DETAILS
Governance	As referenced in Chapter 3, two critical streams of work for the implementation of the Healthy City program are Privacy and Security, and Engagement. These streams will work collaboratively, with guidance from their associated Advisory Groups (Data and Privacy, and Residents), to ensure meaningful resident engagement throughout the lifecycle of projects.
Ownership and Control	During the implementation of the Healthy City program, there will be no transfer of ownership of information or data from the primary owner and steward of that data. The City will ensure the community retains ownership over the information gathered throughout the development and implementation of projects by working collaboratively with residents and stakeholders to establish processes and plans that meet their expectations. The community will be informed as to how their information and data is being used to inform, enhance or build projects.
Consent	Consent for the collection and sharing of information and data will be maintained through open and transparent communication with partners and community through the progression of projects and initiatives. A phased approach to implementation and the development of projects allows for information and data to be identified and sourced on an as-needed basis ensuring the Healthy City program can clearly articulate the need and use to the owner of that information.
Data Minimization and De-Identification	The Healthy City program will only use anonymized datasets. The procedure for data collection and anonymization are outlined in Chapter 4. Data processing will only use as much data as is required to successfully accomplish the outcomes of the specific project. Additionally, data collected for one purpose will not be repurposed.
Accessibility	Open Data is all about promoting transparency and innovation – making data truly accessible and barrier-free. Edmonton's Open Data Portal provides public access to hundreds of datasets. Available in multiple formats, these datasets can be downloaded for free. Whenever possible and appropriate, new datasets will be shared through the Open Data Portal to allow for community access and the potential for locally-based solutions to be developed. A growing number of entrepreneurs, creative municipal employees and community members use open data to develop innovative products and enhance public service delivery.
Security	Data will be hosted through the same cloud-based infrastructure as the current Open Data Portal. The City's standardized cyber security contractual requirements for cloud solutions will be applied to the Healthy City program. These standards include leveraging ISO standards for controls, controlling information and protecting data.

7.7 OPEN AND BIG DATA STRATEGIES

7.7.1 OPEN DATA AT THE CITY OF EDMONTON

The City is continuously enhancing the quality and increasing the quantity of information available through open data. By provisioning, delivering, consuming and crowdsourcing data, the City, along with residents and partners, enhances services, stimulates economic opportunities, encourages innovation and unlocks new social values. It is this approach that not only positions Edmonton as a leader in open government, but allows the City to work collaboratively with other municipalities and communities to share resources and experiences that transform how governments interact with residents and partners.

7.7.2 OPEN CITY PRINCIPLES

The principles shown in Figure 21, govern the City of Edmonton's approach to being an Open City. They are the foundation from which other communities interested in developing open programs and initiatives can learn and grow.

As an Open City, the entire City of Edmonton organization is working to build new ways to share information with residents, find new opportunities for dialogue and make services easier to access. Under the governance of the Open City Initiative and Edmonton's Open Data Strategy, and with adherence to privacy and security standards that meet the expectations of regulatory bodies and residents, the application of the Healthy City program will continue to demonstrate Edmonton's leadership in the practice of open government and commitment to building a city of the future alongside residents and partners.

7.7.3 TRANSFERABILITY AND REPLICABILITY

Edmonton, as an Open City, learns from and integrates aspects of other open government initiatives. The City is evolving to collect and share data that will influence how public services are designed and delivered globally. Through this mindset of continuous learning and evolution, the City of Edmonton is a collaborator and contributor to how other communities can increase their capacity for open government.

FIGURE 21: Open City Principles



COLLABORATIVE

The City actively engages Edmontonians, non-profit organizations, businesses and the community to design and deliver programs and services in an integrated and effective manner.

INCLUSIVE

Edmontonians and City employees have access to information, programs and services, and the democratic processes that shape municipal decisions. This means reducing socio-economic, physical and technical barriers, while creating accessible channels for delivery of programs and services.

INNOVATIVE

With the participation of Edmontonians and employees, the City envisions, creates and fosters new approaches, and efficient and sustainable practices.

PARTICIPATORY

The City values and respects public input and engages people in decision-making. Community consultation provides valuable input into the decision-making process.

TRANSPARENT

The City is a steward of the information we manage and the services we provide on behalf of Edmontonians. Being transparent with Edmontonians and City employees promotes trust and accountability. The City's information is a public asset; consistent with privacy and protection legislation, it is disclosed in forms that Edmontonians can readily find and use.

7.8 RISKS

Potential risks for data privacy and security include the inability to keep up with changing regulations and resident expectations, as well as insufficient training for employees and partners. The City of Edmonton has assessed these and other program risks related to data management, privacy and security and has developed a series of mitigating actions to reduce their impact and

likelihood. Data Privacy and Security risks are shown in Table 24. Likelihood and impact are measured on a scale of 1-5, with 1 being extremely low and 5 being extremely high. The likelihood and impact measures are multiplied to establish the overall risk score. Risks with scores between 1 and 6 are given a low risk rating, 7 and 12 a medium risk rating, 13 and 20 a high risk rating, and 21 and 25 an extreme risk rating.

TABLE 24: Data Privacy and Security Risks and Mitigating Actions

RISK	LIKELIHOOD	IMPACT	RISK SCORE	RISK RATING	MITIGATING ACTIONS
Security or privacy breach at a partner organization results in loss of trust in program	1	4	4	Low	All members of the Healthy City Ecosystem and anyone working on the implementation of the Healthy City program (including employees and contractors) will be trained on the processes and standards including collection, use and disclosure of information. Develop and maintain an incident management plan.
Changing regulations on data privacy results in additional resources required to manage changes	2	4	8	Medium	Ongoing engagement with the Office of the Information and Privacy Commissioner of Alberta to ensure future iterations of data and privacy practices are in line with standards and requirements. Resources will be allocated to ensure changes are managed appropriately.
Regulations governing data privacy are modified or changed resulting in insufficient processes	2	4	8	Medium	Ongoing engagement with the Office of the Information and Privacy Commissioner of Alberta to ensure future iterations of data and privacy practices are in line with standards and requirements. Resources will be allocated to ensure processes are updated accordingly.
Lack of proactive communication with residents results in them raising concerns over data privacy and security	2	4	8	Medium	Privacy and security processes and standards are clearly communicated with residents. Residents are encouraged to share their feedback and concerns regarding data privacy and security.
Inability to assess ethical considerations related to data result in loss of trust in program	2	4	8	Medium	Development of a data ethics and responsibility framework referencing the Information Accountability Foundation's Essential Elements of Accountability and the United Nations Global Pulse Risks, Harm and Benefits Assessment Tool. Ongoing engagement with the Office of the Information and Privacy Commissioner of Alberta to assist in assessing ethical considerations.
Security or privacy breach results in loss of trust in program	2	5	10	Medium	Processes and standards are in place to ensure the privacy and security of data and information. All members of the Healthy City Ecosystem and anyone working on the implementation of the Healthy City program (including employees and contractors) will be educated on the processes and standards including collection, use and disclosure of information. Develop and maintain an incident management plan.

8.0 FINANCIAL

The City of Edmonton delivers programs and services to more than 900,000 residents through the management of an annual operating budget of \$3 billion and a capital budget of \$4 billion over four years (2019–2022). The City has been recognized as the most open and transparent municipality in Canada by the Public Sector Digest (2015, 2016 and 2017) and has robust accountability structures, financial controls, processes and systems to support the delivery of a \$60 million multi-stakeholder, multi-year program.

The following definitions are being used in this chapter for key terms:

Cash Contributions: Matching capital and operating funds committed to spend to deliver solutions. Cash contributions could come from a government, private or non-profit organization.

In-Kind Contributions: Contributions such as providing access to research, subject matter expertise, skilled resources, laptops, phones, internet access and office spaces as required by the program team and stakeholders. In-kind contributions could come from a government, private or non-profit organization.

Hard cost: The tangible assets (technology and/or physical infrastructure) and the resources (including labour

and materials) directly involved in putting the asset into production, often referred to as capitalized costs.

Soft cost: An expense that is not considered a hard cost. Examples of soft costs include architectural, engineering, financing and legal fees, and other pre- and post-program expenses.

8.1 PROGRAM BUDGET

A detailed Financial Plan for the Healthy City program has been developed in alignment with the three phases of implementation and the program work streams. The summary of the program budget is shown in Table 25. The total budget is \$60 million, as matching contributions totaling \$10 million are planned from the City of Edmonton as well as additional organizations and stakeholders.

TABLE 25: Healthy City Program Budget

(MILLIONS)	PHASE 1: INITIATE		PHASE 2: INNOVATE		PHASE 3: EMBRACE		TOTAL	
Funding	\$10.0		\$31.0		\$19.0		\$60.0	
Program Management	\$0.9	9%	\$0.9	3%	\$0.7	4%	\$2.6	4%
Engagement	1.9	19%	3.9	13%	4.2	22%	10.0	17%
Data and Technology	0.8	8%	4.1	13%	2.2	12%	7.1	12%
Privacy and Security	0.7	7%	3.4	11%	1.4	8%	5.6	9%
Healthy City Projects	3.0	30%	10.8	35%	3.8	20%	17.6	29%
Municipal Capacity Building	1.8	18%	5.0	16%	4.8	26%	11.6	19%
Contingency - 10%	0.9	9%	2.8	9%	1.7	9%	5.5	9%
Expenditures (rounded)	\$10.0	100%	\$31.0	100%	\$19.0	100%	\$60.0	100%
NET	0.0		0.0		0.0		0.0	

For the Healthy City program, the soft costs are 54 per cent of the total \$60 million budget. Table 26 provides a summary of the program's hard and soft costs.

TABLE 26: Healthy City Program Hard and Soft Costs by Work Stream

WORK STREAMS	HARD COST		SOFT COST	
	MILLIONS	%	MILLIONS	%
Program Management	\$0.0	0%	\$2.6	100%
Engagement	0.0	0%	10.0	100%
Data and Technology	6.3	88%	0.8	12%
Privacy and Security	4.4	78%	1.2	22%
Healthy City Projects	12.3	70%	5.3	30%
Municipal Capacity Building	0.0	0%	11.6	100%
Contingency - 10%	4.4	80%	1.1	20%
NET	\$27.4	46%	\$32.6	54%

A detailed payment schedule was developed, including milestones and deliverables, and is included as part of Chapter 2 (see 2.4 Milestones, Deliverables and Payment Schedule).

8.1.1 METHODOLOGY

The Financial Plan has been developed by considering best practices applied to other similar-sized City of Edmonton programs, analyzing data from similar-sized agreements and contracts, conducting market and industry consultations, and interviewing subject matter experts.

The Financial Plan follows an activity-based costing methodology, identifying hard and soft costs associated with each program work stream and corresponding activities. Costs associated with the acquisition and implementation of technology assets under the Privacy and Security and Data and Technology work streams have been categorized as hard costs. The Healthy City Projects work stream will deliver projects that will acquire and implement additional technology assets such as wearables, sensors, etc. As such, 70 per cent of project costs have been identified as hard costs. Costs associated with managing the program, developing intellectual property, and delivering communications and engagement activities have been categorized as soft costs. These activities do not produce

tangible technology or physical infrastructure assets but are critical to the achievement of the program's two outcomes and sub-outcomes outlined in Chapters 1 and 2.

The analog estimation method was used to prepare a substantive budget which provides a -10 per cent to +15 per cent accuracy. This method compares previous similar work to the proposed work of the Healthy City program to establish an estimated budget. During the Initiate phase, the Program Management Office will be able to develop a definitive budget (+/-5 per cent accuracy) as detailed information will become available from the prospective vendors through requests for proposals (RFPs). Budgets for subsequent phases will be progressively developed through adequate monitoring and planning of the program components and individual projects.

The City of Edmonton has cash flowed projected expenditures and revenues and is prepared to fund shortfalls through its operating budget for the duration of the five year implementation plan.

8.1.2 ASSUMPTIONS

The Healthy City program Financial Plan was built based on the following assumptions that have been taken into consideration in developing the overall program budget.

1. The City of Edmonton contributes \$5 million in addition to the funding received from Infrastructure Canada through the Smart Cities Challenge.
2. Stakeholder organizations who are part of the Health City Ecosystem contribute an additional \$5 million in Phase 3 of the program.
3. The projects invest 70 per cent of the funds in implementing technology solutions.
4. The Healthy City program will implement 10 projects (three small, two medium and five large).
5. Small projects are completed in 12-15 months and cost \$150,000 per quarter.
6. Medium projects are completed in 18-20 months and cost \$250,000 per quarter.
7. Large projects are completed in 24-30 months and cost \$320,000 per quarter.
8. The first Healthy City Project is ConnectED for a total cost of just under \$4.4 million. Under the breakdown of

10 Healthy City projects, ConnectED comprises three of the 10 because each phase has a distinct deliverable. The first phase is a large project, the second is a medium project, and the third is a small project in order to effectively implement and scale this complex resident tool.

9. City of Edmonton staff costs are charged to the program utilizing current market rates.
10. In keeping with project management practices, a 10 per cent contingency has been incorporated into the budget.
11. Eighty per cent of the contingency funds are allocated to implement technology solutions.
12. A zero per cent inflation rate has been assumed over the five years.
13. The Healthy City program commences on July 1, 2019.
14. There are 20 working days in a month with seven hours in a day.

8.2 CONTRIBUTIONS (FINANCIAL OR IN-KIND) FROM OTHER SOURCES, AND APPROACH TO LEVERAGE REVENUES

Through the phased implementation of the Healthy City program, new or changes to existing programs, services or policies will be identified and actioned in order to achieve the program's outcomes. These actions will not be the sole responsibility of the City of Edmonton to implement – some of the actions will be implemented directly by or in collaboration with Healthy City Ecosystem partners through funds and in-kind contributions.

Through program and project management processes, consideration will be made for each action on the economic and social return on investment, feasibility and sustainability. Only actions that will provide a positive impact to the outcomes will be considered for implementation. This will result in the program being more attractive to private and partner investments. Additionally, as the program begins to extend to other municipalities, including data, technology platforms and analytic models, the scale of the impact and return will increase exponentially.

The Healthy City Ecosystem partners have provided a commitment to implementing actions identified through the Healthy City program, as demonstrated through letters of support included in the Appendices. In addition, the program is expecting matching capital investments as listed in Table 27.

TABLE 27: Healthy City Program Matching Capital Investments

ORGANIZATION	AMOUNT	FOCUS AREA(S)
City of Edmonton	\$5 million	Investment to implement data security and privacy management program (the technology, processes and change management aspects)
Private as yet undetermined	\$5 million	Private or community-based funding to augment the Healthy City Ecosystem data sharing infrastructure

8.3 TOOLS AND PROCESSES

The City of Edmonton has established program and project management processes and tools. The City uses the SAP Project Systems Module as the Program Cost Information Management System which tracks costs by activities. The system is integrated with time entry, accounts payable and receivable, and procurement systems, which provides a consolidated view of all critical elements of the project. In addition, the City has sophisticated program and project monitoring processes that provide the following information to Executive Leadership Team members, elected officials, program governance committees and residents through Tableau dashboards, Council reports and other executive reports:

- Overall project status compared to prior period for:
 - Schedule
 - Scope
 - Budget
- Highlights, accomplishments and planned activities
- Milestone details including per cent complete, status, start and end date
- Issues and risks including mitigation plan and accountability

- Project financials including total budget, actuals to date, accruals, estimate to complete and variance to budget

For the program and project team members, detailed status reports and project logs are shared on an as-needed basis. This report includes the following financial measures:

- Schedule Metrics
 - Baseline Project Start Date
 - Actual Project Start Date
 - Baseline Project Finish Date
 - Forecast/Actual Project Finish Date
 - Per cent Complete by Milestone
 - Baseline Milestone Completion Date
 - Forecast/Actual Milestone Completion Date
- Cost Metrics
 - Baseline Cost
 - Actual Costs to Date
 - Cost Estimate to Complete
 - Cost Accrual for the Period
 - Cost Variance

8.4 RISKS

The risks for the financial plan include a reduction in funding levels and potential program or project delays as a result of timing of funds received. The City of Edmonton has assessed these and other program risks related to data management, privacy and security and has developed a series of mitigating actions to reduce their impact and likelihood including a 10 per cent contingency. Financial risks are shown in Table 28. Likelihood and impact are measured on a scale of 1-5, with 1 being extremely low and 5 being extremely high. The likelihood and impact measures are multiplied to establish the overall risk score. Risks with scores between 1 and 6 are given a low risk rating, 7 and 12 a medium risk rating, 13 and 20 a high risk rating, and 21 and 25 an extreme risk rating.

TABLE 28: Financial Risks and Mitigating Actions

RISK	LIKELIHOOD	IMPACT	RISK SCORE	RISK RATING	MITIGATING ACTIONS
Partner investments or in-kind contributions are lower than expected which impacts reach, ability to make a greater impact and possibly sustainability over the long-term	2	3	6	Low	Ongoing engagement with partners and stakeholders including reporting on progress towards achieving outcomes. Where possible, leverage existing agreements already in place (Startup In Residence, Health City, MetroLab Network, etc.). Prioritize projects and other program initiatives and assign resources as appropriate. Develop succession plans to ensure continuity in the event of reduced resources.
Timing of funds received results in delays to overall program or project-specific implementation	2	3	6	Low	Prioritize projects and other program initiatives and reassign resources as required.

8.5 SMART CITIES CHALLENGE FINALIST GRANT REPORT

The Smart Cities Challenge Grant Summary in Table 29 provides a final breakdown of City of Edmonton expenses under the Smart Cities Challenge Finalist Grant.

TABLE 29: Smart Cities Challenge Finalist Grant Budget

EXPENSES	DESCRIPTION	TOTAL
Consulting Services	Program development and privacy	\$152,428
Personnel	Smart Cities Challenge Team	\$28,826
Communications	Website hosting fees, promotional videos, finalist video, advertising, submission designer	\$37,936
Engagement	Community engagement sessions, community engagement event materials and supplies, community surveys, community event sponsorship, site visit	\$26,761
Technology	Technology program support	\$4,049
Total Expenditure		\$250,000

During the final proposal development, the City of Edmonton continued to engage with the community through both in-person and digital communication channels and invested 26 per cent (versus 25 per cent as planned) of the \$250,000 grant funding into engagement activities. Priorities were realigned resulting in an investment of 72 per cent (versus 50 per cent as planned) of the grant funding in the development of a robust proposal and Smart City Framework that encompasses

resident and partner engagement and data ethics, privacy and security at its core. The technology pilot accounted for two per cent (versus 25 per cent as planned) of the grant funding. The City decided not to build a technical tool and instead the funds were directed toward ensuring the privacy and security framework would set the Healthy City program up for a successful implementation. Additional costs of \$190,000 were incurred by the City of Edmonton during the development of the finalist proposal.

HEALTHY CITY PROGRAM FINANCIALS

CITY OF EDMONTON SMART CITIES CHALLENGE BUDGET

SUMMARY & ASSUMPTIONS

The City will receive cash from the Canadian Government of:	\$50,000,000					
<i>The City will receive cash and in-kind contributions from private companies and non-private companies.</i>						
The City's cash contributions:	\$5,000,000					
<i>The City will also provide access to printers, computers, etc. that are part of general duties in-kind.</i>						
Private and community in-kind contributions:	\$5,000,000					
<i>This could be by providing software, hosting a deployment, etc.</i>						
Allocation of funding that is not from the Canadian Government:		Year 1	Year 2	Year 3	Year 4	Year 5
		0%	0%	5%	10%	85%
<i>Personnel are assumed to be at the market rate. See Resource Rates Chart.</i>						
Assumes the number of days in a month:	20					
Assumes the number of hours in a day:	7					
Hard cost associated with Projects:	70%					
Number of Health City Projects delivered:	10					
Program contingency:	10%					
Percentage of hard cost in contingency:	80%					

(Millions)	Phase 1: Initiate		Phase 2: Innovate		Phase 3: Embrace		Total	
Funding	\$10.00		\$31.00		\$19.00		\$60.00	
Program Management	\$0.9	9%	\$0.9	3%	\$0.7	4%	\$2.6	4%
Engagement	1.9	19%	3.9	13%	4.2	22%	10.0	17%
Data and Technology	0.8	8%	4.1	13%	2.2	12%	7.1	12%
Privacy and Security	0.7	7%	3.4	11%	1.4	8%	5.6	9%
Healthy City Projects	3.0	30%	10.8	35%	3.8	20%	17.6	29%
Municipal Capacity Building	1.8	18%	5.0	16%	4.8	26%	11.6	19%
Contingency - 10%	0.9	9%	2.8	9%	1.7	9%	5.5	9%
Expenditures (rounded)	\$10.0	100%	\$31.0	100%	\$19.0	100%	\$60.0	100%

NET	0.0	0.0	0.0	0.0
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Work Streams	Hard Cost		Soft Cost	
	millions	%	millions	%
Program Management	\$0.0	0%	\$2.6	100%
Engagement	0.0	0%	10.0	100%
Data and Technology	6.3	88%	0.8	12%
Privacy and Security	4.4	78%	1.2	22%
Healthy City Projects	12.3	70%	5.3	30%
Municipal Capacity Building	0.0	0%	11.6	100%
Contingency - 10%	4.4	80%	1.1	20%
NET	\$27.4	46%	\$32.7	54%

HEALTHY CITY PROGRAM FINANCIALS

CITY OF EDMONTON SMART CITIES CHALLENGE BUDGET

CASH FLOW ANALYSIS

COST ELEMENTS	Phase 1								Phase 2										Phase 3										Summary	
	Year 1				Year 2				Year 3						Year 4				Year 5						Phase 3 Total	Phase 3 %	Total	% of Total		
	Q1	Q2	Q3	Q4	Q1	Q2	Phase 1		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Phase 2	Phase 2	Q3	Q4	Q1	Q2	Q3	Q4					Phase 3	Phase 3
	Sept 30	Dec 31	Mar 31	Jun 30	Sept 30	Dec 31	Total	%	Mar 31	Jun 30	Sept 30	Dec 31	Mar 31	Jun 30	Sept 30	Dec 31	Total	%	Mar 31	Jun 30	Sept 30	Dec 31	Mar 31	Jun 30					Total	%
Expenses																														
Program Management	163,800	185,850	162,960	156,240	137,340	131,670	937,860	9%	102,690	102,690	121,590	121,590	121,590	121,590	121,590	121,590	934,920	3%	121,590	121,590	121,590	124,740	124,740	124,740	738,990	4%	2,611,770	4%		
Engagement	198,541	247,200	293,300	293,300	410,500	410,500	1,853,341	19%	415,500	415,500	420,500	420,500	559,100	559,100	575,900	575,700	3,941,800	13%	702,600	702,600	702,600	702,600	702,600	702,600	4,215,600	22%	10,010,741	17%		
Data and Technology	131,250	131,250	131,250	131,250	131,250	131,250	787,500	8%	631,250	140,700	795,700	300,700	805,700	310,700	315,700	820,700	4,121,150	13%	325,700	330,700	435,700	340,700	345,700	450,700	2,229,200	12%	7,137,850	12%		
Privacy and Security	96,600	96,600	100,800	128,100	137,550	165,900	725,550	7%	244,250	729,950	239,400	739,400	239,400	239,400	739,400	239,400	3,410,600	11%	239,400	239,400	239,400	239,400	239,400	239,400	1,436,400	8%	5,572,550	9%		
Healthy City Projects	0	311,134	311,134	466,638	933,276	933,276	2,955,458	30%	1,485,069	1,485,069	1,329,565	1,103,585	1,414,719	1,414,719	1,414,719	1,174,061	10,821,505	35%	862,927	777,772	777,772	777,772	311,134	311,134	3,818,511	20%	17,595,473	29%		
Municipal Capacity Building	141,750	206,850	235,200	378,000	415,800	453,600	1,831,200	18%	453,600	453,600	613,200	613,200	651,000	684,600	722,400	760,200	4,951,800	16%	760,200	760,200	831,600	831,600	831,600	831,600	4,846,800	25%	11,629,800	19%		
Contingency - 10%	73,194	117,888	123,464	155,353	216,572	222,620	909,091	9%	333,236	332,751	351,995	329,898	379,151	333,011	388,971	369,165	2,818,177	9%	301,242	293,226	310,866	301,681	255,517	266,017	1,728,550	9%	5,455,818	9%		
TOTAL EXPENSES	805,135	1,296,772	1,358,108	1,708,881	2,382,288	2,448,816	10,000,000	100%	3,665,594	3,660,259	3,871,950	3,628,873	4,170,660	3,663,120	4,278,680	4,060,816	30,999,952	100%	3,313,658	3,225,488	3,419,528	3,318,493	2,810,691	2,926,191	19,014,051	100%	60,014,003	100%		
Funding (Thousands - '000)																														
Grant	500,000	1,500,000	1,500,000	1,500,000	2,500,000	2,500,000	10,000,000	100%	3,500,000	3,500,000	4,000,000	3,500,000	4,000,000	3,500,000	4,000,000	4,000,000	30,000,000	97%	3,000,000	3,000,000	1,000,000	1,000,000	1,000,000	1,000,000	10,000,000	53%	50,000,000	83%		
Other Funding	0	0	0	0	0	0	0	0%	0	0	125,000	125,000	125,000	125,000	250,000	250,000	1,000,000	3%	250,000	250,000	2,125,000	2,125,000	2,125,000	2,125,000	9,000,000	47%	10,000,000	17%		
TOTAL FUNDING	500,000	1,500,000	1,500,000	1,500,000	2,500,000	2,500,000	10,000,000	100%	3,500,000	3,500,000	4,125,000	3,625,000	4,125,000	3,625,000	4,250,000	4,250,000	31,000,000	100%	3,250,000	3,250,000	3,125,000	3,125,000	3,125,000	3,125,000	19,000,000	100%	60,000,000	100%		
Net	(305,135)	203,228	141,892	(208,881)	117,712	51,184	0	0	(165,594)	(160,259)	253,050	(3,873)	(45,660)	(38,120)	(28,680)	189,184	48	0	(63,658)	24,512	(294,528)	(193,493)	314,309	198,809	(14,051)	0	(14,003)	0%		
Fiscal Year	2019	2020	2021	2022	2023	2024																								
City of Edmonton Cash Flow by year	(101,908)	101,908	(76,677)	76,724	(527,168)	513,117																								

HEALTHY CITY PROGRAM FINANCIALS

CITY OF EDMONTON SMART CITIES CHALLENGE BUDGET

PROGRAM MANAGEMENT

COST ELEMENTS	Phase 1								Phase 2								Phase 3								Summary
	Year 1				Year 2				Year 3				Year 4				Year 5				Total				
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4					
Governance																									
Branch Manager	15,750	15,750	15,750	15,750	6,300	6,300	3,150	3,150	3,150	3,150	3,150	3,150	3,150	3,150	3,150	3,150	3,150	6,300	6,300	6,300	129,150				
Program Manager / Manager Business Analytics	23,100	23,100	11,550	11,550	11,550	11,550	4,620	4,620	4,620	4,620	4,620	4,620	4,620	4,620	4,620	4,620	4,620	4,620	4,620	4,620	157,080				
Program Manager / Business Strategist / Project Manager	18,900	18,900	7,560	18,900	18,900	18,900	7,560	7,560	7,560	7,560	7,560	7,560	7,560	7,560	7,560	7,560	7,560	7,560	7,560	7,560	207,900				
Program Manager / Business Strategist / Project Manager	9,450	9,450	9,450	9,450	9,450	9,450	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	83,160				
Administrative Assistant	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	210,000				
Governance Expenses	77,700	77,700	54,810	66,150	56,700	56,700	27,720	27,720	27,720	27,720	27,720	27,720	27,720	27,720	27,720	27,720	27,720	30,870	30,870	30,870	787,290				
Strategy																									
Program Manager / Business Strategist / Project Manager	18,900	18,900	18,900	18,900	9,450	3,780	3,780	3,780	3,780	3,780	3,780	3,780	3,780	3,780	3,780	3,780	3,780	3,780	3,780	3,780	141,750				
Senior Advisor	6,300	6,300	6,300	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	1,260	40,320				
Technology Representative	3,780	3,780	3,780	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	43,470				
Industry Expert	3,780	3,780	3,780	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	43,470				
Health Expert	3,780	3,780	3,780	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	43,470				
Engagement Expert	3,780	3,780	3,780	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	43,470				
Data Scientists	3,780	3,780	3,780	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	43,470				
Data Ethics Advisors	3,780	3,780	3,780	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	1,890	43,470				
Financial Advisor	3,360	3,360	3,360	1,680	1,680	1,680	1,680	1,680	1,680	1,680	1,680	1,680	1,680	1,680	1,680	1,680	1,680	1,680	1,680	1,680	38,640				
Administrative Support	8,400	8,400	8,400	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	96,600				
Strategy Expenses	51,240	51,240	51,240	33,180	23,730	18,060	18,060	18,060	18,060	18,060	18,060	18,060	18,060	18,060	18,060	18,060	18,060	18,060	18,060	18,060	481,530				
Planning Expenses																									
Project Manager	9,450	18,900	18,900	18,900	18,900	18,900	18,900	18,900	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	595,350				
Analysts	8,400	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	327,600				
Administrative Support	4,200	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	163,800				
Planning Expenses	22,050	44,100	44,100	44,100	44,100	44,100	44,100	44,100	63,000	63,000	63,000	63,000	63,000	63,000	63,000	63,000	63,000	63,000	63,000	63,000	1,086,750				
Outcomes/Measurements																									
Senior Analyst / Evaluation and Reporting	9,450	9,450	9,450	9,450	9,450	9,450	9,450	9,450	9,450	9,450	9,450	9,450	9,450	9,450	9,450	9,450	9,450	9,450	9,450	9,450	189,000				
Administrative Support	3,360	3,360	3,360	3,360	3,360	3,360	3,360	3,360	3,360	3,360	3,360	3,360	3,360	3,360	3,360	3,360	3,360	3,360	3,360	3,360	67,200				
Outcomes/Measurements Expenses	12,810	12,810	12,810	12,810	12,810	12,810	12,810	12,810	12,810	12,810	12,810	12,810	12,810	12,810	12,810	12,810	12,810	12,810	12,810	12,810	256,200				
TOTAL PROGRAM MANAGEMENT EXPENSES	163,800	185,850	162,960	156,240	137,340	131,670	102,690	102,690	121,590	121,590	121,590	121,590	121,590	121,590	121,590	121,590	121,590	124,740	124,740	124,740	2,611,770				

HEALTHY CITY PROGRAM FINANCIALS

CITY OF EDMONTON SMART CITIES CHALLENGE BUDGET

ENGAGEMENT

COST ELEMENTS	Phase 1				Phase 2				Phase 3				Phase 4				Phase 5				Summary
	Year 1				Year 2				Year 3				Year 4				Year 5				Total
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Project Manager	28,350	75,600	75,600	75,600	75,600	75,600	75,600	75,600	75,600	75,600	113,400	113,400	113,400	113,400	113,400	113,400	113,400	113,400	113,400	113,400	1,842,750
Engagement Logistics	33,600	33,600	67,200	67,200	67,200	67,200	67,200	67,200	67,200	67,200	168,000	168,000	168,000	168,000	168,000	168,000	168,000	168,000	168,000	168,000	2,284,800
Facilitator (Focus Groups, in-depth interviews, etc)	37,800	37,800	37,800	37,800	75,600	75,600	75,600	75,600	75,600	75,600	75,600	75,600	75,600	75,600	113,400	113,400	113,400	113,400	113,400	113,400	1,587,600
Change Manager	37,800	37,800	37,800	37,800	75,600	75,600	75,600	75,600	75,600	75,600	75,600	75,600	75,600	75,600	113,400	113,400	113,400	113,400	113,400	113,400	1,587,600
Communications	33,600	33,600	33,600	33,600	67,200	67,200	67,200	67,200	67,200	67,200	67,200	67,200	67,200	67,200	100,800	100,800	100,800	100,800	100,800	100,800	1,411,200
Administrative Support	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	33,600	33,600	33,600	33,600	33,600	33,600	33,600	33,600	470,400
Engagement - other Canadian municipalities/European for travel expenses			10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	180,000
Advertising (including promotional materials)	1,091	2,500	5,000	5,000	10,000	10,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	25,000	25,000	25,000	25,000	25,000	25,000	303,591
Hosting	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,300	10,000	10,000	10,000	10,000	10,000	10,000	94,800
Facilitation (specialist and materials)	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	100,000
External Space Rent	2,000	2,000	2,000	2,000	5,000	5,000	5,000	5,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	148,000
TOTAL EXPENSES	198,541	247,200	293,300	293,300	410,500	410,500	415,500	415,500	420,500	420,500	559,100	559,100	575,900	575,700	702,600	702,600	702,600	702,600	702,600	702,600	10,010,741

HEALTHY CITY PROGRAM FINANCIALS

CITY OF EDMONTON SMART CITIES CHALLENGE BUDGET

DATA & TECHNOLOGY

COST ELEMENTS	Phase 1				Phase 2				Phase 3				Phase 4				Phase 5				Summary	
	Year 1				Year 2				Year 3				Year 4				Year 5					
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Total	
Technology																						
Common Technology Infrastructure							500,000		500,000		500,000		500,000				100,000			100,000	2,200,000	
Data Repository									155,000	160,000	165,000	170,000	175,000	180,000	185,000	190,000	195,000	200,000	205,000	210,000	2,190,000	
Team 1																						
Project Manager	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	756,000	
Business Analyst	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	756,000	
Technology Support	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	378,000	
Change Manager	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	378,000	
Implementation Support	9,450	9,450	9,450	9,450	9,450	9,450	9,450	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	18,900	311,850	
Reporting & Support	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	8,400	168,000	
TOTAL EXPENSES	131,250	131,250	131,250	131,250	131,250	131,250	631,250	140,700	795,700	300,700	805,700	310,700	315,700	820,700	325,700	330,700	435,700	340,700	345,700	450,700	7,137,850	
Assumptions																						
Annual base cost of existing Open Data Catalogue	150,000																					
Cost of each additional data source	50																					
Estimated additional data sources	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
Annual base cost of a repository	150,000																					
Cost of each additional data source	50																					
Estimated additional data sources									500	500	500	500	500	500	500	500	500	500	500	500	500	

HEALTHY CITY PROGRAM FINANCIALS

CITY OF EDMONTON SMART CITIES CHALLENGE BUDGET

PRIVACY & SECURITY

COST ELEMENTS	Phase 1								Phase 2								Phase 3								Summary
	Year 1				Year 2				Year 3				Year 4				Year 5				Total				
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4					
Security Infrastructure							50,000	500,000					500,000				500,000							1,550,000	
Project Manager	18,900	18,900	18,900	18,900	18,900	28,350	28,350	28,350	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	633,150	
Office of the City Clerk Representative (Senior)	18,900	18,900	18,900	18,900	18,900	18,900	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	642,600	
Office of the City Clerk Representative (Intermediate)	16,800	16,800	16,800	16,800	16,800	16,800	16,800	33,600	33,600	33,600	33,600	33,600	33,600	33,600	33,600	33,600	33,600	33,600	33,600	33,600	33,600	33,600	33,600	554,400	
Privacy Expert	18,900	18,900	18,900	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	699,300	
Technology Expert	9,450	9,450	9,450	9,450	18,900	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	623,700	
Operations (ingest data, monitor, etc.)	9,450	9,450	9,450	9,450	9,450	9,450	18,900	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	567,000	
Administrative Support	4,200	4,200	8,400	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	16,800	302,400	
TOTAL EXPENSES	96,600	96,600	100,800	128,100	137,550	165,900	244,250	729,950	239,400	739,400	239,400	239,400	739,400	239,400	239,400	239,400	239,400	239,400	239,400	239,400	239,400	239,400	239,400	5,572,550	

MUNICIPAL CAPACITY BUILDING

COST ELEMENTS	Phase 1								Phase 2								Phase 3								Summary
	Year 1				Year 2				Year 3				Year 4				Year 5				Total				
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4					
Project Manager	28,350	28,350	37,800	37,800	75,600	75,600	75,600	75,600	75,600	75,600	113,400	113,400	113,400	113,400	113,400	113,400	151,200	151,200	151,200	151,200	1,871,100				
Business Analyst	16,800	33,600	33,600	67,200	67,200	67,200	67,200	67,200	100,800	100,800	100,800	134,400	134,400	134,400	134,400	134,400	134,400	134,400	134,400	134,400	1,932,000				
Privacy Expert	37,800	37,800	37,800	75,600	75,600	75,600	75,600	75,600	113,400	113,400	113,400	113,400	113,400	113,400	113,400	113,400	113,400	113,400	113,400	113,400	1,852,200				
Data Scientist	18,900	18,900	37,800	37,800	37,800	75,600	75,600	75,600	75,600	75,600	75,600	75,600	75,600	75,600	113,400	113,400	113,400	113,400	113,400	113,400	1,549,800				
Technology Expert	18,900	37,800	37,800	75,600	75,600	75,600	75,600	75,600	113,400	113,400	113,400	113,400	151,200	151,200	151,200	151,200	151,200	151,200	151,200	151,200	2,135,700				
Operations (Ingest data, monitor, etc.)	16,800	33,600	33,600	67,200	67,200	67,200	67,200	67,200	100,800	100,800	100,800	100,800	100,800	100,800	100,800	100,800	134,400	134,400	134,400	134,400	1,764,000				
Administrative Support	4,200	16,800	16,800	16,800	16,800	16,800	16,800	16,800	33,600	33,600	33,600	33,600	33,600	33,600	33,600	33,600	33,600	33,600	33,600	33,600	525,000				
TOTAL EXPENSES	141,750	206,850	235,200	378,000	415,800	453,600	453,600	453,600	613,200	613,200	651,000	684,600	722,400	760,200	760,200	760,200	831,600	831,600	831,600	831,600	11,629,800				

HEALTHY CITY PROGRAM FINANCIALS

CITY OF EDMONTON SMART CITIES CHALLENGE BUDGET

HEALTHY CITY PROJECTS

COST ELEMENTS	Phase 1								Phase 2								Phase 3								Summary
	Year 1				Year 2				Year 3				Year 4				Year 5								Total
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4					
Technology Budget																									
<i>Smart Cities Challenge technology program growing with each project</i>																									
Project 1 - ConnectED Phase 1 - Large	-	311,134	311,134	311,134	311,134	311,134	311,134	311,134	311,134	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,489,072
Project 2 - ConnectED Phase 2 - Medium	-	-	-	-	-	-	-	-	-	240,659	240,659	240,659	240,659	240,659	240,659	240,659	-	-	-	-	-	-	-	-	1,443,951
Project 3 - Connect ED Phase 3 - Small	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	155,504	155,504	155,504	-	-	-	-	-	-	466,512
Project 4 - Large	-	-	-	-	311,134	311,134	311,134	311,134	311,134	311,134	311,134	311,134	-	-	-	-	-	-	-	-	-	-	-	-	2,489,072
Project 5 - Large	-	-	-	-	-	-	311,134	311,134	311,134	311,134	311,134	311,134	311,134	311,134	311,134	-	-	-	-	-	-	-	-	-	2,489,072
Project 6 - Large	-	-	-	-	-	-	-	-	-	-	-	-	311,134	311,134	311,134	311,134	311,134	311,134	311,134	311,134	311,134	311,134	311,134	-	2,489,072
Project 7 - Large	-	-	-	-	-	-	-	-	-	-	311,134	311,134	311,134	311,134	311,134	311,134	311,134	311,134	311,134	311,134	-	-	-	-	777,520
Project 8 - Small	-	-	-	-	155,504	155,504	155,504	155,504	155,504	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	777,520
Project 9 - Medium	-	-	-	-	-	-	240,659	240,659	240,659	240,659	240,659	240,659	240,659	240,659	240,659	-	-	-	-	-	-	-	-	-	1,684,610
Project 10 - Small	-	-	-	155,504	155,504	155,504	155,504	155,504	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	777,520
TOTAL EXPENSES	-	311,134	311,134	466,638	933,276	933,276	1,485,069	1,485,069	1,329,565	1,103,585	1,414,719	1,414,719	1,414,719	1,174,061	862,927	777,772	777,772	777,772	311,134	311,134					17,595,473

HEALTHY CITY PROGRAM FINANCIALS

CITY OF EDMONTON SMART CITIES CHALLENGE BUDGET

HEALTHY CITY PROJECT EXAMPLE

COST ELEMENTS	Phase 1								Phase 2								Phase 3							
	Year 1				Year 2				Year 3				Year 4				Year 5							
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Large Project																								
Project Team																								
Project Manager	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Business Analyst	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	37,800	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Department Representative	3,780	3,780	3,780	3,780	3,780	3,780	3,780	3,780	3,780	3,780	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Technology Support	5,670	5,670	5,670	11,340	11,340	11,340	11,340	7,560	7,560	7,560	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Change Manager	5,670	5,670	5,670	9,450	9,450	9,450	18,900	18,900	18,900	18,900	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Implementation Support	9,450	9,450	9,450	18,900	18,900	18,900	18,900	18,900	18,900	18,900	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Reporting & Support	13,440	13,440	13,440	13,440	13,440	13,440	13,440	13,440	13,440	13,440	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engagement																								
Engagement Logistics	18,900	9,450	18,900	9,450	18,900	9,450	18,900	9,450	18,900	9,450	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Facilitator (Focus Groups, in-depth interviews, etc)	11,550	11,550	11,550	4,620	4,620	11,550	11,550	11,550	4,620	4,620	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Change Manager	5,670	5,670	5,670	5,670	5,670	5,670	5,670	5,670	5,670	5,670	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Communications	9,450	9,450	9,450	9,450	9,450	9,450	9,450	9,450	9,450	9,450	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Project Specific Advisory Committee(s)																								
Senior Advisors FTE equivalent	11,550	11,550	11,550	11,550	11,550	11,550	11,550	11,550	11,550	11,550	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Support	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	4,200	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subject Matter Experts for projects	23,100	23,100	23,100	23,100	23,100	23,100	23,100	23,100	23,100	23,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Senior Research and liaison with other Healthy City initiatives (best practices)	5,670	5,670	5,670	5,670	5,670	5,670	5,670	5,670	5,670	5,670	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Technology Assets																								
New technologies				500,000				500,000																
TOTAL EXPENSES	203,700	194,250	203,700	696,770	215,670	213,150	232,050	718,820	221,340	211,890	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Assumptions

Average Project Cost used on the Healthy City
All Projects Chart

311,134 Average expenses per quarter

TOTAL EXPENSES	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Medium Project																				
Project Manager	18,900	28,350	28,350	28,350	28,350	28,350	28,350	0	0	0	0	0	0	0	0	0	0	0	0	0
Business Analyst	28,350	28,350	28,350	28,350	28,350	28,350	28,350	0	0	0	0	0	0	0	0	0	0	0	0	0
Department Representative	3,780	3,780	3,780	3,780	3,780	3,780	3,780	0	0	0	0	0	0	0	0	0	0	0	0	0
Technology Support	5,670	5,670	7,560	7,560	13,230	13,230	7,560	0	0	0	0	0	0	0	0	0	0	0	0	0
Change Manager	7,560	7,560	13,230	13,230	18,900	18,900	18,900	0	0	0	0	0	0	0	0	0	0	0	0	0
Implementation Support	7,560	11,340	11,340	11,340	11,340	11,340	18,900	7,560	0	0	0	0	0	0	0	0	0	0	0	0
Reporting & Support	6,720	6,720	6,720	6,720	6,720	6,720	6,720	0	0	0	0	0	0	0	0	0	0	0	0	0
Engagement																				
Engagement Logistics	15,120	15,120	9,450	15,120	15,120	9,450	15,120	0	0	0	0	0	0	0	0	0	0	0	0	0
Facilitator (Focus Groups, in-depth interviews, etc)	4,620	4,620	4,620	4,620	4,620	4,620	4,620	0	0	0	0	0	0	0	0	0	0	0	0	0
Change Manager	3,780	3,780	3,780	3,780	3,780	3,780	3,780	0	0	0	0	0	0	0	0	0	0	0	0	0
Communications	9,450	9,450	9,450	9,450	9,450	9,450	9,450	0	0	0	0	0	0	0	0	0	0	0	0	0
Project Specific Advisory Committee(s)																				
Senior Advisors FTE equivalent	11,550	11,550	11,550	11,550	11,550	11,550	11,550	0	0	0	0	0	0	0	0	0	0	0	0	0

HEALTHY CITY PROGRAM FINANCIALS

CITY OF EDMONTON SMART CITIES CHALLENGE BUDGET

HEALTHY CITY PROJECT EXAMPLE (CONTINUED)

COST ELEMENTS	Phase 1								Phase 2								Phase 3							
	Year 1				Year 2				Year 3				Year 4				Year 5				Q1	Q2	Q3	Q4
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Support	4,200	4,200	4,200	4,200	4,200	4,200	4,200	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subject Matter Experts for projects	18,480	18,480	18,480	18,480	18,480	18,480	18,480	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Senior Research and liaison with other Healthy City Initiatives (best practices)	3,780	3,780	3,780	3,780	3,780	3,780	3,780	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Technology Assets																								
New technologies			250,000			250,000																		
TOTAL EXPENSES	149,520	162,750	414,640	170,310	181,650	433,540	172,200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Assumptions

Average Project Cost used on the Healthy City
All Projects Chart

240,659 Average expenses per quarter

TOTAL EXPENSES	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Small Project																				
Project Manager	11,340	11,340	11,340	11,340	11,340	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Business Analyst	18,900	18,900	18,900	18,900	18,900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Department Representative	1,890	1,890	1,890	1,890	1,890	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Technology Support	3,780	5,670	9,450	9,450	9,450	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Change Manager	3,780	3,780	13,230	18,900	18,900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Implementation Support	5,670	9,450	13,230	18,900	13,230	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Reporting & Support	3,360	3,360	3,360	3,360	3,360	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Engagement																				
Engagement Logistics	9,450	9,450	9,450	9,450	9,450	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Facilitator (Focus Groups, in-depth interviews, etc)	2,310	2,310	2,310	2,310	2,310	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Change Manager	3,780	3,780	3,780	3,780	3,780	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Communications	3,780	3,780	3,780	3,780	3,780	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Project Specific Advisory Committee(s)																				
Senior Advisors FTE equivalent	4,620	4,620	4,620	4,620	4,620	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Support	1,680	1,680	1,680	1,680	1,680	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subject Matter Expert for projects	9,240	9,240	9,240	9,240	9,240	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subject Matter Experts for projects	3,780	3,780	3,780	3,780	3,780	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Technology Assets																				
New technologies				250,000																
TOTAL EXPENSES	87,360	93,030	110,040	371,380	115,710	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Assumptions

Average Project Cost used on the Healthy City
All Projects Chart

155,504 Average expenses per quarter

HEALTHY CITY PROGRAM FINANCIALS

CITY OF EDMONTON SMART CITIES CHALLENGE BUDGET

HEALTHY CITY PROJECT EXAMPLE RESOURCES

COST ELEMENTS	Phase 1				Phase 2				Phase 3			
	Year 1				Year 2				Year 3			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Large Project												
Project Manager	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
Business Analyst	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%		
Department Representative	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%		
Technology Support	15%	15%	15%	30%	30%	30%	30%	20%	20%	20%		
Change Manager	15%	15%	15%	25%	25%	25%	50%	50%	50%	50%		
Implementation Support	25%	25%	25%	25%	50%	50%	50%	50%	50%	50%		
Reporting & Support	40%	40%	40%	40%	40%	40%	40%	40%	40%	40%		
Engagement												
Engagement Logistics	50%	25%	50%	25%	50%	25%	50%	25%	50%	25%		
Facilitator (Focus Groups, in-depth interviews, etc)	25%	25%	25%	10%	10%	25%	25%	25%	10%	10%		
Change Manager	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%		
Communications	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%		
Project Specific Advisory Committee (s)												
Senior Advisors FTE equivalent	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%		
Support	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%		
Subject Matter Experts for projects	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%		
Senior Research and liaison with other Healthy City initiatives (best practices)	15%	15%	15%	15%	15%	15%	15%	15%	15%	15%		
Medium Project												
Project Manager	50%	50%	50%	50%	50%	50%	50%					
Business Analyst	75%	75%	75%	75%	75%	75%	75%					
Department Representative	10%	10%	10%	10%	10%	10%	10%					
Technology Support	15%	15%	20%	20%	35%	35%	20%					
Change Manager	20%	20%	35%	35%	50%	50%	50%					
Implementation Support	20%	30%	30%	30%	30%	50%	20%					
Reporting & Support	20%	20%	20%	20%	20%	20%	20%					
Engagement												
Engagement Logistics	40%	40%	25%	40%	40%	25%	40%					
Facilitator (Focus Groups, in-depth interviews, etc)	10%	10%	10%	10%	10%	10%	10%					
Change Manager	10%	10%	10%	10%	10%	10%	10%					
Communications	25%	25%	25%	25%	25%	25%	25%					
Project Specific Advisory Committee (s)												
Senior Advisors FTE equivalent	25%	25%	25%	25%	25%	25%	25%					
Support	25%	25%	25%	25%	25%	25%	25%					
Subject Matter Expert for projects	40%	40%	40%	40%	40%	40%	40%					
Senior Research and liaison with other Healthy City initiatives (best practices)	10%	10%	10%	10%	10%	10%	10%					
Small Project												
Project Manager	30%	30%	30%	30%	30%							
Business Analyst	50%	50%	50%	50%	50%							

HEALTHY CITY PROGRAM FINANCIALS

CITY OF EDMONTON SMART CITIES CHALLENGE BUDGET

HEALTHY CITY PROJECT EXAMPLE RESOURCES (CONTINUED)

COST ELEMENTS	Phase 1								Phase 2								Phase 3							
	Year 1				Year 2				Year 3				Year 4				Year 5							
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Department Representative	5%	5%	5%	5%	5%																			
Technology Support	10%	15%	25%	25%	25%																			
Change Manager	10%	10%	35%	50%	50%																			
Implementation Support	15%	25%	35%	50%	35%																			
Reporting & Support	10%	10%	10%	10%	10%																			
Engagement																								
Engagement Logistics	25%	25%	25%	25%	25%																			
Facilitator (Focus Groups, in-depth interviews, etc)	5%	5%	5%	5%	5%																			
Change Manager	10%	10%	10%	10%	10%																			
Communications	10%	10%	10%	10%	10%																			
Project Specific Advisory Committee (s)																								
Senior Advisors FTE equivalent	10%	10%	10%	10%	10%																			
Support	10%	10%	10%	10%	10%																			
Subject Matter Experts for projects	20%	20%	20%	20%	20%																			
Subject Matter Experts for projects	10%	10%	10%	10%	10%																			

HEALTHY CITY PROGRAM FINANCIALS

CITY OF EDMONTON SMART CITIES CHALLENGE BUDGET

RESOURCE MATRIX

COST ELEMENTS	Phase 1								Phase 2								Phase 3							
	Year 1				Year 2				Year 3				Year 4				Year 5							
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
Program Management - Governance																								
Branch Manager (BM1)	25%	25%	25%	25%	10%	10%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	10%	10%	10%				
Program Manager / Manager Business Analytics (ML4)	50%	50%	25%	25%	25%	25%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%				
Program Manager / Business Strategist / Project Manager (PT3)	50%	50%	20%	50%	50%	50%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%				
Program Manager / Business Strategist / Project Manager (PT3)	25%	25%	25%	25%	25%	25%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%				
Support (Administrative Assistant)	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%				
Program Management - Strategy																								
Program Manager / Business Strategist / Project Manager (PT3)	50%	50%	50%	50%	25%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%				
Senior Advisor (BM1)	10%	10%	10%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%				
Technology Representative (PT3)	10%	10%	10%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%				
Industry Expert (PT3)	10%	10%	10%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%				
Health Expert (PT3)	10%	10%	10%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%				
Engagement Expert (PT3)	10%	10%	10%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%				
Data Scientists (PT3)	10%	10%	10%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%				
Data Ethics Advisors (PT3)	10%	10%	10%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%				
Financial Advisor (MAIL)	10%	10%	10%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%				
Administrative Support (Clerical Assistant)	50%	50%	50%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%				
Program Management - Lifecycle Management																								
Procurement specialist (PT3)	25%	50%	50%	50%	50%	50%	50%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%				
Analysts (MA II)	25%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%				
Administrative Support (Clerical Assistant)	25%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%				
Engagement																								
Project Manager (PT3)	75%	200%	200%	200%	200%	200%	200%	200%	200%	200%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%				
Engagement Logistics (MAIL)	100%	100%	200%	200%	200%	200%	200%	200%	200%	200%	500%	500%	500%	500%	500%	500%	500%	500%	500%	500%				
Facilitator (Focus Groups, in-depth interviews, etc) (PT3)	100%	100%	100%	100%	200%	200%	200%	200%	200%	200%	200%	200%	200%	200%	200%	300%	300%	300%	300%	300%				
Change Manager (PT3)	100%	100%	100%	100%	200%	200%	200%	200%	200%	200%	200%	200%	200%	200%	200%	300%	300%	300%	300%	300%				
Communications (MAIL)	100%	100%	100%	100%	200%	200%	200%	200%	200%	200%	200%	200%	200%	200%	200%	300%	300%	300%	300%	300%				
Administrative Support (Clerical Assistant)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	200%	200%	200%	200%	200%	200%	200%	200%				
Data and Technology																								
Team 1																								
PM (PT3)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%				
BA (IT Analyst)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%				
Technology Support (AIS III)	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%				
Change Manager (PT3)	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%				
Implementation Support (AIS III)	25%	25%	25%	25%	25%	25%	25%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%				
Reporting & Support (MAIL)	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%				
Healthy City Projects																								

HEALTHY CITY PROGRAM FINANCIALS

CITY OF EDMONTON SMART CITIES CHALLENGE BUDGET

RESOURCE MATRIX CONTINUED

COST ELEMENTS	Phase 1								Phase 2								Phase 3							
	Year 1				Year 2				Year 3				Year 4				Year 5							
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
<i>Smart Cities Challenge technology program growing with each project</i>																								
Project 1 - ConnectED Phase 1 - Large	0%	100%	100%	100%	100%	100%	100%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Project 2 - ConnectED Phase 2 - Medium	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	100%	100%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Project 3 - Connect ED Phase 3 - Small	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%	100%	100%	0%	0%	0%	0%
Project 4 - Large	0%	0%	0%	0%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Project 5 - Large	0%	0%	0%	0%	0%	0%	100%	100%	100%	100%	100%	100%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Project 6 - Large	0%	0%	0%	0%	0%	0%							100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Project 7 - Large	0%	0%	0%	0%	0%	0%	0%				100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%	0%	0%	0%
Project 8 - Small	0%	0%	0%	0%	100%	100%	100%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Project 9 - Medium	0%	0%	0%	0%	0%	0%	100%	100%	100%	100%	100%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Project 10 - Small	0%	0%	0%	100%	100%	100%	100%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Privacy and Security																								
Project Manager (PT3)	50%	50%	50%	50%	50%	75%	75%	75%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Office of the City Clerk Rep (Senior) (PT3)	50%	50%	50%	50%	50%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Office of the City Clerk Rep (Intermediate) (MAIL)	50%	50%	50%	50%	50%	50%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Privacy Expert (PT3)	50%	50%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Technology Expert (PT3)	25%	25%	25%	25%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Operations (ingest data, monitor etc) (PT3)	25%	25%	25%	25%	25%	25%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Administrative Support (Clerical Assistant)	25%	25%	50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Municipal Capacity Building																								
Project Manager (PT3)	75%	75%	100%	100%	200%	200%	200%	200%	200%	200%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%
Business Analyst (MAIL)	50%	100%	100%	200%	200%	200%	200%	200%	200%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%
Privacy Expert (PT3)	50%	50%	100%	100%	100%	200%	200%	200%	200%	200%	200%	200%	200%	200%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%
Data Ethics Experts (PT3)	100%	100%	100%	200%	200%	200%	200%	200%	200%	200%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%
Technology Expert (PT3)	50%	100%	100%	200%	200%	200%	200%	200%	200%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%
Operations (MAIL)	50%	100%	100%	200%	200%	200%	200%	200%	200%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%	300%
Administrative Support (Clerical Assistant)	25%	100%	100%	100%	100%	100%	100%	100%	200%	200%	200%	200%	200%	200%	200%	200%	200%	200%	200%	200%	200%	200%	200%	200%
Monitor, Report, Sustain																								
Senior analyst to develop logic models and reporting, compile reports etc (PT3)	0%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%	25%
Administrative Support (Clerical Assistant)	0%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%

HEALTHY CITY PROGRAM FINANCIALS

CITY OF EDMONTON SMART CITIES CHALLENGE BUDGET

GRANT FUNDING PAYMENT SCHEDULE

COST ELEMENTS	Phase 1								Phase 2								Phase 3								Total
	Year 1				Year 2				Year 3				Year 4				Year 5								
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4					
Outcome Based Payments - See Chapter 2	500,000	1,500,000	1,500,000	1,500,000	2,500,000	2,500,000	3,500,000	3,500,000	4,000,000	3,500,000	4,000,000	3,500,000	4,000,000	4,000,000	3,000,000	3,000,000	1,000,000	1,000,000	1,000,000	1,000,000	50,000,000				
Total Grant Funding	500,000	1,500,000	1,500,000	1,500,000	2,500,000	2,500,000	3,500,000	3,500,000	4,000,000	3,500,000	4,000,000	3,500,000	4,000,000	4,000,000	3,000,000	3,000,000	1,000,000	1,000,000	1,000,000	1,000,000	50,000,000				

HEALTHY CITY PROGRAM FINANCIALS

CITY OF EDMONTON SMART CITIES CHALLENGE BUDGET

OPEN CITY & TECHNOLOGY RESOURCE RATES

POSITION	Regular Rate
BM1 - Branch Manager	\$ 150.00
BM2 - Senior Director	\$ 130.00
ML2 - Program Manager	\$ 80.00
ML3 - Program Manager / Manager Business Analytics	\$ 90.00
ML4 - Director	\$ 110.00
PT2 - Strategic Coordinator I	\$ 70.00
PT3 - Program Manager / Business Strategist / Project Manager	\$ 90.00
PT4 - Program Manager / Senior Business Strategist	\$ 100.00
Administrative Assistant	\$ 50.00
AIS I = AT, SA	\$ 70.00
AIS II = BV, VK, HK	\$ 80.00
AIS III = JRP, KS	\$ 90.00
Business Co-op Student & Other	
Business Process Analyst ERP	\$ 90.00
Clerical Assistant	\$ 40.00
Clerk II	\$ 40.00
Clerk IV	\$ 50.00
Computer Facilities Supervisor	\$ 90.00
Computer Support Technician	\$ 50.00
Data Storage Operator	\$ 50.00
Desktop Support Supervisor	\$ 70.00
Domain Architect	\$ 90.00
IT Analyst = BA, Mobility	\$ 90.00
IT Project Manager	\$ 90.00
IT Sourcing Analyst	\$ 70.00
IT Sourcing Technician	\$ 50.00
Methods Analyst I	\$ 60.00
Methods Analyst II	\$ 80.00
Senior Domain Architect	\$ 90.00
Senior IT Analyst = RC	\$ 90.00
Senior IT Project Manager	\$ 90.00
Technical Training Facilitator I	\$ 60.00
Technical Training Facilitator II	\$ 80.00

9.0 IMPLEMENTATION PHASE REQUIREMENTS

9.1 DUTY TO CONSULT WITH INDIGENOUS GROUPS

The City of Edmonton recognizes there is a Duty to Consult with Indigenous groups. The City will work to build relationships rooted in trust and respect and will encourage Nations' Leadership and Elders to endorse and participate in activities for successful program implementation.

The City of Edmonton will work with Indigenous communities to create solutions that will improve their quality of life. Through the implementation of the Healthy City program, the City will work with Nations to seek wisdom and guidance on matters that affect our communities the most. Indigenous community data gathering may be a component of this in the future and the approach will be developed in consultation with community leaders.

Critical Success Factors include:

- Relationship building
- Opening clear communication lines
- Coordinating planning efforts across City of Edmonton departments, province, federal governments, non-profit organizations, private and community organizations.
- Respecting First Nations self-determination processes, including the right of autonomy and the Treaty Rights to Health (Truth and Reconciliation/United Nations Declaration on the Rights of Indigenous Peoples)
- Transparency and accountability

The Edmonton and surrounding area has the second largest urban Indigenous population in Canada, representing five per cent of the population. The City of Edmonton's Indigenous Relations reflects the ongoing efforts to define the City's long-term strategic direction to collaborate with and support Indigenous Peoples who call Edmonton home. The principles of relationships, agreements, celebration and renewal guide Indigenous relations at the City of Edmonton.

The Edmonton Urban Aboriginal Accord is a principle-based relationship agreement between Aboriginal Communities

in Edmonton and the City of Edmonton Administration to strengthen relationships between the City of Edmonton and Urban Aboriginal Peoples (2005).

The City of Edmonton has developed partnership agreements with various Indigenous organizations and communities including:

- Memorandum of Understanding, Enoch First Nation and the City of Edmonton (2017)
- Memorandum of Coordination and Collaboration, Her Majesty the Queen of Right of Alberta and the City of Edmonton (2013)
- Memorandum of Cooperation and Dialogue, Confederacy of Treaty Six First Nations and the City of Edmonton (2012)
- Memorandum of Shared Recognition and Cooperation, Métis Nation of Alberta and the City of Edmonton (2013)

9.2 MODERN TREATY OBLIGATIONS

The City of Edmonton acknowledges that we reside in Treaty Six Territory and the traditional Métis homeland of Region Four, and together call upon our collective honoured traditions and spirit to maintain a strong and lasting relationship with First Nations, Métis and Inuit peoples.

Treaties form the basis of the relationship between the Crown and First Nations Communities. The process of treaty-making in Canada is continuing to evolve as a result of developments in Indigenous groups. Due to the time and circumstances in which Treaty Six was negotiated, and the anticipated project solutions, the City of Edmonton does not foresee any impact on Modern Treaty Obligations for the Implementation Phase.

The City of Edmonton will work to support our provincial and federal government partners to fulfill their obligations. We will leverage existing structures such as the City of Edmonton Indigenous Relations Office to provide insight on best practices toward building reciprocal relationships between the City and Indigenous peoples, as well as organizations that serve Indigenous communities.

The City will act as an advocate, conduit, partner and witness to improve the quality of life for our urban Indigenous communities. The City and partners will work to ensure that the solutions are resident driven, culturally safe and inclusive.

9.3 COMMUNITY EMPLOYMENT BENEFIT

The City of Edmonton draws its energy not only from the ground but its residents. The City of Edmonton is a nationally recognized top employer:

- 2017 Canada's Best Diversity Employer
- 2017 Alberta's Top 70 Employers
- 2018 Canada's Top Employers for Young People
- Employer of Choice for Women Building Futures

The City of Edmonton is committed to hiring individuals from a variety of backgrounds. We value the diverse opinions and perspectives that form the fabric of our teams. Through the diversity of our workforce we will connect better with residents, foster creative and innovate solutions and improve our workplace culture.

The City of Edmonton is committed to providing employment opportunities for Indigenous peoples, newcomers to Canada, people with disabilities, students and youth, visible minorities, individuals transitioning from the Canadian Armed Forces, and eliminating the gender gap in targeted occupations.

The City of Edmonton has programs designed to support the following populations with their employment at the City:

- **Indigenous Peoples:** The City of Edmonton has numerous hiring programs designed to recruit and retain Indigenous staff including the Summer Student Program, Post-Secondary Graduate Internship Program, Staff Support Administrative Professional Pool, and Nikâniw Aquatic Leadership Program.
- **Newcomers to Canada:** To support newcomers, the City of Edmonton provides opportunities, which allow newcomers to Canada to gain valuable work experience, develop professional skills and learn about working at the City of Edmonton. We work with educational institutions

including NorQuest College, Robertson College, CDI College, and Campbell College to provide their students with opportunities to complete their work practicums.

- **People with Disabilities:** The City of Edmonton has an Abilities @ Work program that creates meaningful, unique employment opportunities for people with intellectual disabilities at the City of Edmonton.

The City's procurement processes follow best practices for public sector procurement and are in accordance with the Agreement on Internal Trade, Annex 502.4 (AIT), and the New West Partnership Trade Agreement (NWPTA).

The City of Edmonton's Sustainable Purchasing Policy encourages staff to purchase quality products, services and construction at competitive prices while considering key environmental and social benefits over the entire lifecycle of the product or service, including:

- Energy and water efficiency
- Reduced resource requirements
- Recyclability
- Biodegradability
- Minimal packaging
- Durability
- Workplace health and safety
- International labour standards
- Human rights
- Total cost of ownership
- Supporting small and medium businesses where possible

We value the diverse opinions and perspectives that form the fabric of our teams. Through the diversity of our workforce we will connect better with residents, foster creative and innovate solutions and improve our workplace culture.

9.4 CLIMATE LENS ASSESSMENT

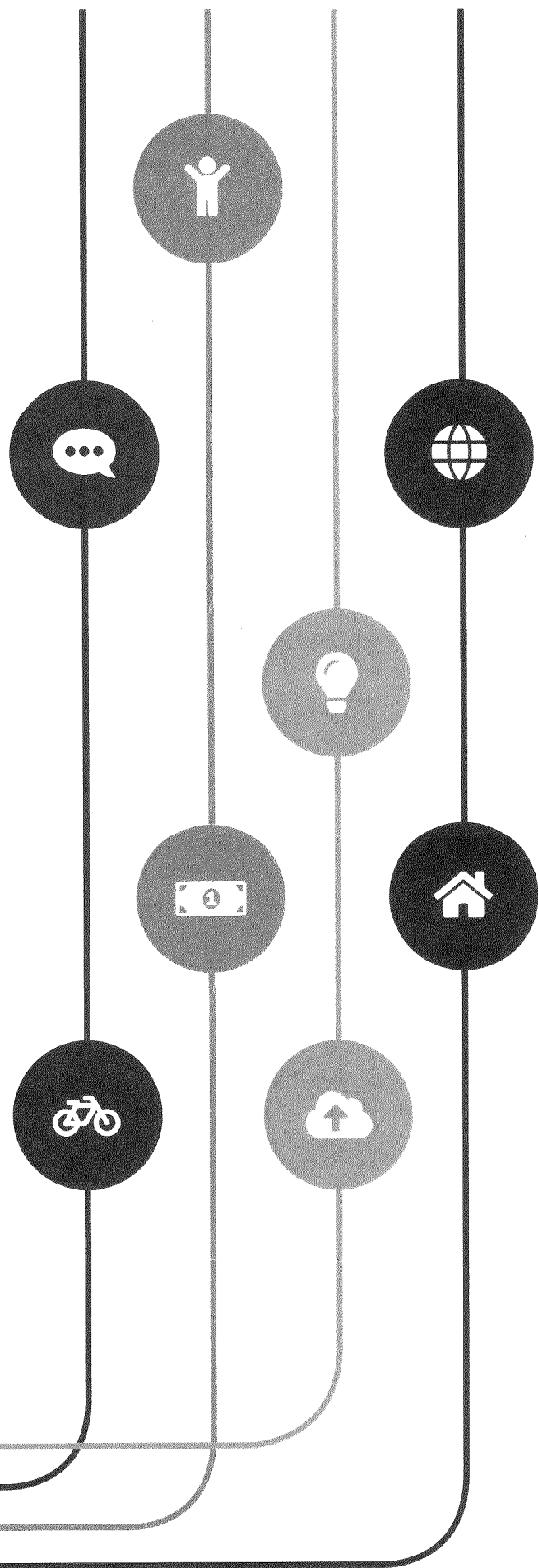
The City of Edmonton plays a role in many social, economic and environmental global systems that support our quality of life and these systems are being disrupted by climate change. We recognize that the actions we take in our community have both local and global impacts.

The Change for Climate is a call to all Edmontonians to work together and take action to reduce our city's greenhouse gas emissions by 35 per cent by 2035. Edmontonians are working together to reduce greenhouse gas (GhG) emissions, thus reducing our contribution to climate change to protect our quality of life, health and economy.

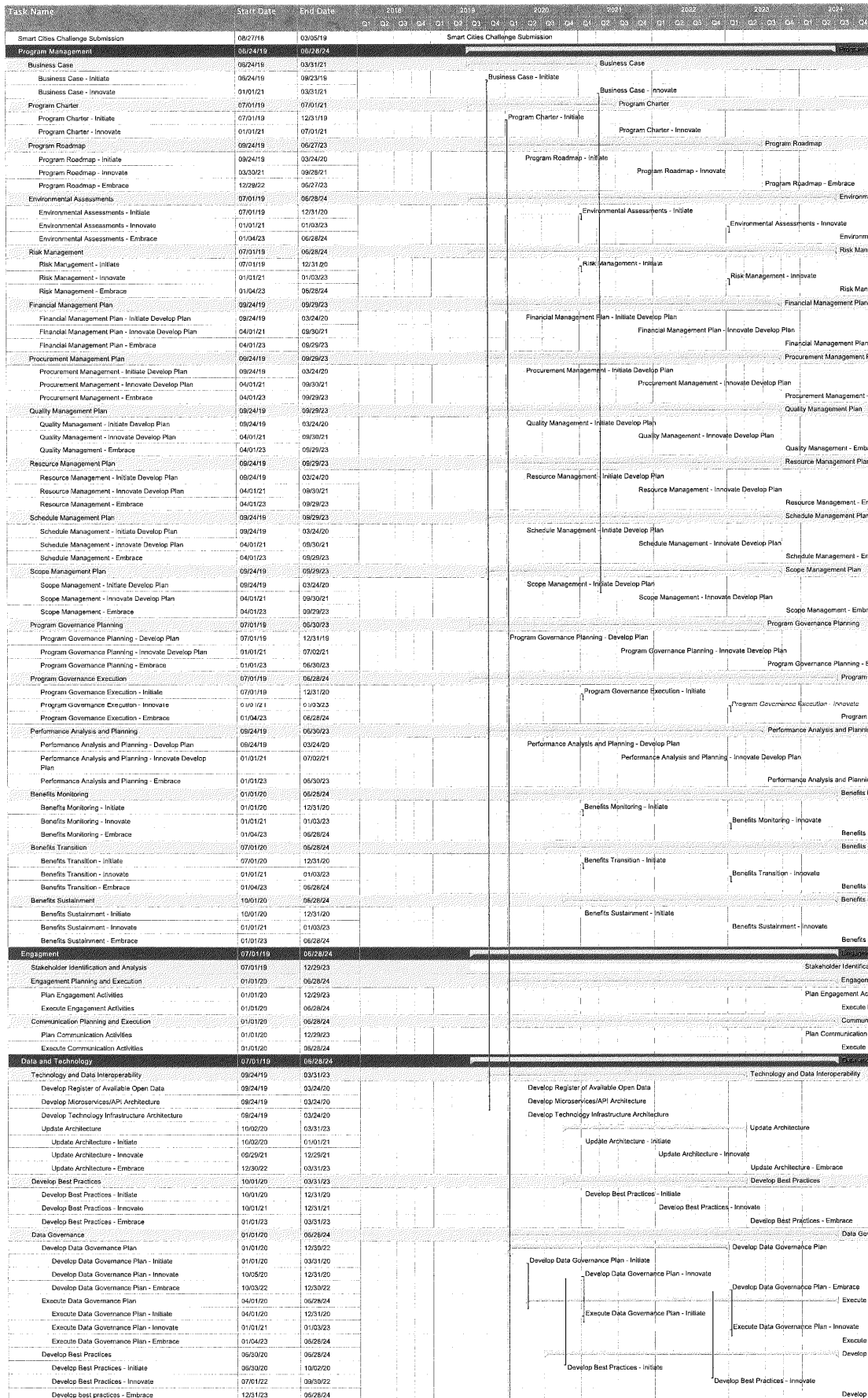
The City of Edmonton will work to impose GhG footprint assessments for each component of the Healthy City program. Working in partnership with community and vendors, we will validate each project's GhG footprint in conformance with the guidance provided by the Federal Government's Climate Change Lens Assessment and international auditing standards outlined by ISO, as required.

9.5 OTHER APPLICABLE LAWS AND REGULATIONS AND POLICIES

In order to inspire, empower and guide collaborative work moving forward, the City of Edmonton will abide by applicable laws, regulations and policies, including any cases of change or exemption to legislation and regulations that may apply to the development and implementation of the Healthy City program.



HEALTHY CITY PROGRAM GANTT CHART



LETTERS OF SUPPORT



www.ab.bluecross.ca



April 6, 2018

Wendy Gnenz
City of Edmonton
17 Floor, Century Place
102A Avenue Edmonton
Edmonton AB T5J 3A3

Dear Wendy:

Re: Smart Cities Challenge – Letter of support

On behalf of Alberta Blue Cross, please accept this letter of support to the City of Edmonton in its proposal for the Smart Cities Challenge.

We fully support the City of Edmonton in its effort to facilitate Edmonton's Smart Cities Challenge proposal development and implementation. We believe that cities play a vital role in prospering community health.

Alberta Blue Cross is committed to improving the health and wellness of citizens. The innovative solutions to Edmonton's most pressing health challenges have the capacity to greatly impact the mental, physical, social, and economic health of those who live, work and play in Edmonton and Canada.

If you require additional information about Alberta Blue Cross, please visit our corporate website at www.ab.bluecross.ca or contact me directly at 780-498-8999 or by email at rpisani@ab.bluecross.ca

Sincerely,

A handwritten signature in black ink, appearing to read "Ray Pisani".

Ray Pisani
President & CEO
Alberta Blue Cross

THE OFFICE OF THE PRESIDENT, RAY R. PISANI
10009 108TH STREET, EDMONTON, ALBERTA, CANADA T5J 3C5 PHONE 780.498.8999

* The Blue Cross symbol and name are registered marks of the Canadian Association of Blue Cross Plans, an association of independent Blue Cross plans. Licensed to ABC Benefits Corporation for use in operating the Alberta Blue Cross Plan. † Blue Shield is a registered trade-mark of the Blue Cross Blue Shield Association. ABC 10305 2016/05



ALBERTA
HEALTH

April 12, 2018

*Deputy Premier
Office of the Minister
MLA, Edmonton-Glenora*

AR 153022

The Honourable Amarjeet Sohi
Minister of Infrastructure and Communities
House of Commons
Ottawa, Ontario
Canada
K1A 0A6

Dear Minister Sohi:

Amarjeet!

I am pleased to provide this letter of support for Edmonton's application to the Smart Cities Challenge.

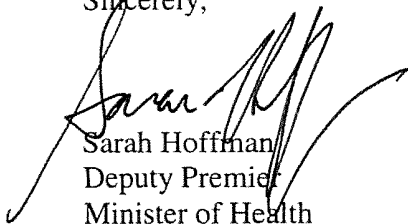
Building on its recent effort to establish Edmonton as Canada's Health City, the City of Edmonton has selected the theme of 'Healthy City' for the Smart Cities Challenge, to improve four health indicators: mental health, physical health, social health, and economic health.

As Alberta's Minister of Health, I am encouraged by Edmonton's theme as it aligns with on-going work and efforts in my Ministry to support a learning health system that seeks to improve the health outcomes of all Albertans.

Alberta is home to one of the largest, most mature health administrative data assets in Canada which have the potential to make the province a global leader in real world evidence. Integration of health and non-health data is essential to support research and innovation, ultimately improving the lives and health of Albertans.

The largest contribution to people's health is the time spent outside of the health system, in the communities where they live, work, and play. The City of Edmonton's application to the Smart Cities Challenge, to use data-supported innovation to improve the four health indicators, has significant potential for future collaboration with my ministry. Through a successful Smart Cities Challenge application, Edmonton will demonstrate to other municipalities the value of data-based innovation and its potential for significant impact on the health outcomes of residents.

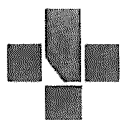
Sincerely,



Sarah Hoffman
Deputy Premier
Minister of Health

423 Legislature Building, 10800 - 97 Avenue, Edmonton, Alberta T5K 2B6 Canada Telephone 780-427-3665 Fax 780-415-0961
10996 - 124 Street, Edmonton, Alberta T5M 0H8 Canada Telephone 780-455-7979 Fax 780-455-2197

Printed on recycled paper



Our File: E1803086

March 26, 2018

Wendy Gnenz
City of Edmonton
17 Floor, Century Place
9803 102A Avenue NW
EDMONTON AB T5J 3A3

Dear Ms. Gnenz:

Re: Smart Cities Challenge – Letter of support

On behalf of Alberta Health Services (AHS), please accept this letter of support for the City of Edmonton in its proposal for the Smart Cities Challenge.

We fully support the City of Edmonton in its effort to facilitate Edmonton's Smart Cities Challenge proposal development and implementation. We believe that cities play a vital role in prospering community health.

Alberta Health Services is Canada's first and largest province-wide, fully integrated health system, responsible for the delivery of health care services to all Albertans. We aspire to lead by example, working to improve health outcomes for Edmontonians. We are excited to support the City of Edmonton to find innovative solutions to Edmonton's most pressing mental, physical, social and economic health issues. As a leader in health data, statistics and reporting across Canada, AHS will work with the City to provide health information that will shape and support the Smart Cities challenge submission and greatly impact the way in which Edmontonians, live, work and play.

If you require more information about AHS, please contact my Executive Associate, Lorinda Prociuk at lorinda.prociuk@ahs.ca or at 780-342-2029.

Sincerely,

Verna Yiu, MD, FRCPC
President and Chief Executive Officer

February 15, 2019

Wendy Gnenz

City of Edmonton
17 Floor, Century Place
102A Avenue Edmonton
Edmonton AB T5J 3A3

Dear Wendy:

Re: Smart Cities Challenge – Letter of support

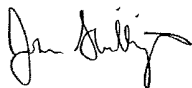
On behalf of the Alberta Machine Intelligence Institute (Amii), I am pleased to offer this letter of support to the City of Edmonton in its proposal for the Smart Cities Challenge.

We fully support the City of Edmonton in its efforts to develop and implement their Smart Cities Challenge finalist proposal. We believe that cities play an important role in encouraging community belonging and connectedness— issues which directly impact the overall health and well-being of our community. By adopting innovative solutions that use data and connected technologies, Edmonton will take a proactive approach to preventing urban isolation and loneliness and building a strong and resilient community.

One of three centres of excellence in the Pan-Canadian AI Strategy, Amii is an Alberta-based research institute that works to push the boundaries of academic knowledge and to guide business understanding of artificial intelligence and machine learning. Amii is excited for the opportunity to support the City in its creation of innovative and adaptive solutions to the Cities most complex health challenges.

If you require more information about Amii, please contact Spencer Murray, Director of Communications & Public Relations at spencer.murray@amii.ca or visit our website at www.amii.ca.

Sincerely,



John Shillington
President & CEO , Alberta Machine Intelligence Institute (Amii)

1100, 10065 Jasper Avenue | Edmonton, AB, Canada | T5J 3B1
amii.ca

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· Georges Brosseau, Director
· Herbert C. Belcourt†, Director
Eldon† & Anne Foote
Harry Hole†
James F. Hole
Ralph K. Hole†
George & Rae Poolet
John & Barbara Poolet Family
Alison Baldwin Rice†
E. John Slatter†
Don† & Joan Stanley
Robert & Shirley Stollery†
Francis Winspear†
†Deceased

April 16, 2018

Wendy Gnenz
City of Edmonton
17 Floor, Century Place
102A Avenue Edmonton
Edmonton AB T5J 3A3

Dear Wendy:

Re: Smart Cities Challenge – Letter of support

The City of Edmonton's Smart Cities plan is an excellent opportunity to bring our community together in a coordinated way around the values of "transparency, experimentation, inclusiveness, empowerment, and knowledge-sharing." Edmonton Community Foundation's work makes Edmonton a Healthy City through its granting, convening, and knowledge sharing.

Granting

The most obvious way Edmonton Community Foundation (ECF) contributes to making Edmonton a Healthy City is by financially supporting front-line community organizations working to improve the indicators of health for Edmontonians. Examples of this include:

- Improving Physical Health by granting \$28,605 to Recreation for Life Foundation's sport and recreation programs in Indigenous communities to create positive experiences for children by building healthy relationships and providing active play opportunities.
- Improving Economic Health by granting \$75,000 a year (a commitment until 2019) to Empower U to improve the financial literacy of low-income women, including a matched savings program to help with asset purchases.
- Improving Mental Health for women by granting \$75,000 a year (a commitment until 2019) to YWCA Edmonton to hire a counselling psychologist.
- Improving Social Health by granting \$47,547 since 2016 to CRIPSiE (Collaborative Radically Integrated Performers Society in Edmonton) which creates high-quality art by including people with disabilities and others who are often marginalized in mainstream arts programs.



COMMUNITY
FOUNDATIONS
OF CANADA
all for community.



9910 103 Street NW Edmonton, AB T5K 2V7 - Ph: (780) 426-0015 - Fax: (780) 425-0121
E-Mail: info@ecfoundation.org - Web Site: www.ecfoundation.org

April 5, 2018

Wendy Grenz
City of Edmonton
17 Floor, Century Place
102A Avenue Edmonton
Edmonton AB T5J 3A3

Dear Wendy:

Re: Smart Cities Challenge – Letter of support

On behalf of the Edmonton Public Library (EPL), please accept this letter of support to the City of Edmonton in its proposal for the Smart Cities Challenge.

We fully support the City of Edmonton in its effort to facilitate Edmonton's Smart Cities Challenge proposal development and implementation. We believe that cities play a vital role in prospering community health.

The innovative solutions to Edmonton's most pressing health challenges have the capacity to greatly impact the mental, physical, social, and economic health of those who live, work and play in Edmonton and Canada.

Edmonton Public Library is excited about the opportunity to partner with the City of Edmonton. As Edmonton's largest lender of information our greatest passion is creating connections which is paralleled in the City of Edmonton's Smart Cities Challenge theme of increasing community and citizen connectedness.

If you require more information about the Edmonton Public Library, please contact us via

www.epl.ca
pilar.matinez@epl.ca
780-496-7050

Yours truly,



Pilar Martinez
Chief Executive Officer

Spread the words.

Office of the Chief Executive Officer • MNP Tower, 10235 101 Street NW • Edmonton, AB • T5J 3G1
T:(780) 496-7051 F:(780) 496-7097



**INSTITUTE OF
HEALTH ECONOMICS**
ALBERTA CANADA

1200 - 10405 Jasper Avenue, Edmonton AB Canada T5J 3N4
Tel. 780.448.4881 Fax. 780.448.0018
ihe.ca

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Institute of Health Economics

April 10, 2018

Wendy Gnenz
Open City and Technology
City of Edmonton
17 Floor, Century Place
9803 - 102A Avenue Edmonton
Edmonton AB T5J 3A3

Dear Ms. Gnenz:

Re: Smart Cities Challenge – Letter of support

On behalf of the Institute for Health Economics (IHE), please accept this letter of support to the City of Edmonton in its proposal for the Smart Cities Challenge.

We fully support the City of Edmonton in its' effort to prepare Edmonton's Smart Cities Challenge proposal development and implementation. We would encourage inclusion in the proposal strong evaluation and objective evidence gathering to steer what is an important effort in social change. It is well documented that local government and the community characteristics of *inclusion* and *connection* play a vital role in prospering improved individual and population health and well-being.

New innovative solutions to Edmonton's most pressing health challenges, utilizing new cross-sectoral data integration capabilities, have the capacity to greatly impact the mental, physical, social, and economic health of those who live, work and play in Edmonton and potentially provide some lessons for other jurisdictions in Canada.

If you require more information about the Institute of Health Economics, www.ihe.ca please contact us via John Sproule, Senior Policy Director, Institute of Health Economics, via jsroule@ihe.ca or 780-862-1905.

Sincerely,

Dr. Chris McCabe
CEO & Executive Director



February 26, 2019

Attn: Wendy Gnenz

City of Edmonton
17 Floor, Century Place
102A Avenue Edmonton
Edmonton, AB T5J 3A3

Dear Wendy:

Re: Smart Cities Challenge – Letter of support

On behalf of Health City, please accept this letter of support to the City of Edmonton in its proposal for the Smart Cities Challenge.

We fully support the City of Edmonton in its effort to facilitate Edmonton's Smart Cities Challenge proposal development and implementation. We believe that cities play a vital role in prospering community health.

Health City is an economic development initiative created to catalyze the health innovation ecosystem in Edmonton. Their focus is on transforming innovations from our health ecosystem into solutions that have commercial application and global relevance; adopting them for impact in Edmonton and scaling them for export to global markets. Edmonton has an outstanding network of academic, health, government and industry partners to position Edmonton as the healthiest city in Canada.

With the support of over 70 public, private and philanthropic organizations across Edmonton, Health City is proud to partner and will support the City of Edmonton in its effort to develop and implement a Healthy City Smart Cities Challenge proposal. We believe it takes a community to improve the health outcomes of our citizens and we will work with the City and community partners to improve the mental, physical, social and economic health challenges of Edmontonians.

If you require more information about Health City please contact Karen Gilchrist at 780.720.5446 or visit our website at edmontonhealthcity.ca.

Sincerely,

Reg Joseph, CEO

edmontonhealthcity.ca

1004 Compass Place, 10050 112 Street NW, Edmonton, Alberta, Canada, T5K 2J1
Phone: 780.628.3101 | Toll Free: 1.844.628.3101 | Email: admin@edmontonhealthcity.ca

April 23, 2018

Wendy Gnenz
City of Edmonton
17 Floor, Century Place
102A Avenue Edmonton
Edmonton, AB T5J 3A3

Dear Wendy:

Re: Smart Cities Challenge – Letter of support

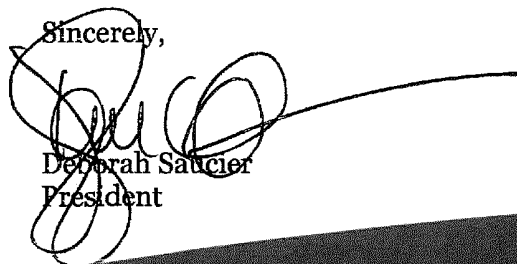
On behalf of MacEwan University, please accept this letter of support to the City of Edmonton in its proposal for the Smart Cities Challenge.

We fully support the City of Edmonton in its effort to facilitate Edmonton's Smart Cities Challenge proposal development and implementation. We believe that cities play a vital role in prospering community health.

MacEwan University is excited for the opportunity to come together and support the City of Edmonton to provide creative solutions through research and innovation in support of Edmonton's submission to the Smart Cities Challenge. We have nearly 20,000 undergraduate students that convene in the downtown core. As a campus, we have the potential to support the Smart Cities Challenge through programs in business, computing science and engineering, health and community studies, design studies and social innovation. Our faculty are committed to student-centered education, and as a result, our teaching and research agenda can be used to create academic collaborations to further strengthen the proposal submission. We are in full support of improving the mental, physical, social and economic health of Edmontonians.

If you require more information about MacEwan University, please contact us via Leo Wong from MacEwan Social Innovation Institute, leo.wong@macewan.ca, (780) 633-3269.

Sincerely,



Deborah Saucier
President

Office of the Vice President
External Affairs and Corporate Counsel

3-013 Singhmar Centre for Learning, 10215 108 Street
Edmonton, AB T5J 1L6



April 17, 2018

Wendy Gnenz
City of Edmonton
17 Floor, Century Place
102A Avenue Edmonton
Edmonton, AB T5J 3A3

Dear Wendy:

Re: Smart Cities Challenge – Letter of support

On behalf of NorQuest College, please accept this letter of support to the City of Edmonton in its proposal for the Smart Cities Challenge.

We fully support the City of Edmonton in its effort to facilitate Edmonton's Smart Cities Challenge proposal development and implementation. We believe that cities play a vital role in promoting community health and improving related outcomes.

NorQuest College is proud to step forward and support the City of Edmonton in its efforts to find an innovative solution to Edmonton's most pressing mental, physical, and economic health challenges.

Located in the heart of downtown Edmonton, NorQuest College prides itself on community based learning that is both relevant and rewarding. We strive to maximize the opportunities of our learners and clients, in doing so – we enhance the socioeconomic health of Alberta. NorQuest College is excited to partner with the City of Edmonton to offer our research, knowledge and expertise in any way that aligns with the vision of Edmonton's Smart Cities Challenge proposal. It is our hope that we can support the City of Edmonton in developing solutions that improve communal health within Edmonton and throughout Canada.

If you require more information about NorQuest College, please contact me via email at joan.hertz@norquest.ca.

Sincerely,

A handwritten signature in dark ink, appearing to read "Joan Hertz", with a long, sweeping horizontal line extending to the right.

Joan Hertz, QC, ICD.D
Vice President External Affairs and Corporate Counsel
NorQuest College

Wendy Gnenz
City of Edmonton
17 Floor, Century Place
102A Avenue Edmonton
Edmonton AB T5J 3A3

April 5th, 2018

Dear Wendy:

Re: Smart Cities Challenge – Letter of support

On behalf of Edmonton Oliver Primary Care Network, please accept this letter of support to the City of Edmonton in its proposal for the Smart Cities Challenge.

We fully support the City of Edmonton in its effort to facilitate Edmonton's Smart Cities Challenge proposal development and implementation. We believe that cities play a vital role in prospering community health.

The innovative solutions to Edmonton's most pressing health challenges have the capacity to greatly impact the mental, physical, social, and economic health of those who live, work and play in Edmonton and Canada.

If you require more information about the Edmonton Oliver Primary Care Network, please contact David Ramsey, Executive Director on dramsey@edmontonoliverpcn.com 587-590-4841.

Sincerely,



David Ramsey
Executive Director
Edmonton Oliver Primary Care Network



15 Sir Winston Churchill Square 102A Avenue - 100 Street Edmonton, AB T5J 2E5 Tel: 780.423.5510 Fax: 780.426.5175 Web: www.MySage.ca

April 9, 2018

Wendy Gnenz
City of Edmonton
17 Floor, Century Place
102A Avenue Edmonton
Edmonton, Alberta T5J 3A3

Dear Ms. Gnenz,

Re: Smart Cities Challenge – Letter of support

It is my pleasure to provide this letter on behalf of the Sage Seniors Association in support of the City of Edmonton's Smart Cities Challenge proposal.

We fully support the City of Edmonton in its effort to facilitate Edmonton's Smart Cities Challenge proposal development and implementation. We believe that cities play a vital role in prospering community health.

The innovative solutions to Edmonton's most pressing health challenges have the capacity to greatly impact the mental, physical, social, and economic health of those who live, work and play in Edmonton and Canada.

If you require more information about the Sage Seniors Association, please contact us via 780.701.9008 or kmcdonald@mysage.ca.

Sincerely,

A handwritten signature in blue ink, appearing to read "Karen McDonald".

Karen McDonald
Executive Director

April 9, 2018

Wendy Grenz
City of Edmonton
17th Floor, Century Place
9803 – 102A Avenue
Edmonton, AB T5J 3A3

Dear Wendy:

Re: Smart Cities Challenge – Letter of support

On behalf of TELUS please accept this letter of support to the City of Edmonton in its proposal for the Smart Cities Challenge.

We fully support the City of Edmonton in its effort to facilitate Edmonton's Smart Cities Challenge proposal development and implementation. We believe that cities play a vital role in prospering community health.

The innovative solutions to Edmonton's most pressing health challenges have the capacity to greatly impact the mental, physical, social, and economic health of those who live, work and play in Edmonton and Canada.

If you require more information about TELUS please contact me at Shane.Sabatino@telus.com or at 780-508-1952.

Sincerely,

A handwritten signature in black ink that reads 'Shane Sabatino'.

Shane Sabatino
President, TELUS Employer Solutions & VP, TELUS Health AB
TELUS Communications Inc.



International Organization for Migration (IOM)
Organisation Internationale pour les Migrations (OIM)
Organización Internacional para las Migraciones (OIM)

8 February 2019

Letter of Support on the Smart Cities Challenge

Dear Ms. Gnenz,

On behalf of the International Organization for Migration (IOM), please accept this letter of support to the City of Edmonton in its submission on the "Smart Cities Challenge" to the Infrastructure Canada.

We believe municipalities can and should play a greater role to enhance the integration of refugees and migrants. Over the past 6 (six) months, we have had several bilateral discussions with the City of Edmonton to identify opportunities for further collaboration, including:

- Research and technical support to strengthen local programs and services aimed at newcomers;
- Exploration of digital tools and apps based on IOM's international work that could be applied to the Edmonton context; and
- Convening international expert meetings to share good practices on strengthening local policies and programmes and scaling successful pilot interventions aimed at newcomers

IOM, part of the United Nations system, is an intergovernmental organization with 172 member states plus many remaining states and organizations as observers, which is committed to the principle that humane and orderly migration benefits migrants and society, acts to: assist in meeting the operational challenges of migration, advance understanding of migration issues, encourage social and economic development through migration, and work towards effective respect of the human rights and well-being of migrants.

IOM is excited to support the City of Edmonton in the "Smart Cities Challenge" endeavor recognizing such support will go a long way in positively impacting the lives of newcomers.

If you require anything further, please consult our website <https://www.iom.int/> or contact Mr. Jobst Koehler +41.22.717 9245, jkoehler@iom.int

Sincerely,

A handwritten signature in dark ink, appearing to read "Renate Held", is written over a light blue horizontal line.

Renate Held
Director

Department of Migration Management

Ms. Wendy Gnenz
Chief Information Officer
City of Edmonton
17th Floor, Century Place
102A Avenue Edmonton
Edmonton AB T5J 3A3
CANADA

Headquarters

17, Route des Morillons, CH-1211 Geneva 19, Switzerland
Tel: +41.22.717.9111 • Fax: +41.22.798.6150 • E-mail: hq@iom.int • Internet: www.iom.int

2-24 South Academic Building (SAB)
Edmonton, Alberta, Canada T6G 2G7
Tel: 780.492.3212
www.president.ualberta.ca

16 April 2018

Ms. Wendy Gnenz
Branch Manager and Chief Information Officer
Open City and Innovation
City of Edmonton
17th Floor, 9803-102A Avenue
Edmonton AB T5J 3A3

Dear Ms. Gnenz,

Re: Smart Cities Challenge – Letter of support

On behalf the University of Alberta, please accept this letter of support for the City of Edmonton's Smart Cities Challenge bid.

With over 100 years of excellence, the University of Alberta, as the province's leading academic and research institution and the fourth leading Major Medical and Research University in Canada, is an active and enthusiastic partner of the City of Edmonton's in Smart Cities bid.

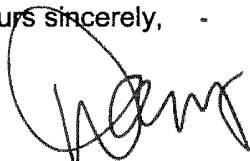
With a strong focus on building partnerships and innovative collaborations with our community health partners, the University of Alberta fully supports the city's vision for the development and implementation of the health-focused Smart Cities Challenge.

At the forefront of ground-breaking research, innovative health devices and interventions that improve health outcomes for Edmontonians and beyond, the University of Alberta shares the city's belief that the many dimensions of health—physical, economic, mental and social—are best served by collaborative efforts that leverage our city's many strengths to improve community health outcomes.

For this reason, the institution has been pleased to partner with the City of Edmonton to mobilize the institution's excellence in research, artificial intelligence, data mining and local and international partnerships to improve the health of Edmontonians.

If you require more information about the University of Alberta, please contact the Office of the President via email president@ualberta.ca or 780-492-3212.

Yours sincerely, -



David H. Turpin, CM, LLD, FRSC
President and Vice-Chancellor



MAYOR DON IVESON
CITY OF EDMONTON

2nd FLOOR, CITY HALL
1 SIR WINSTON CHURCHILL SQUARE
EDMONTON, ALBERTA, CANADA T5J 2R7
PHONE: 780-496-8100
don.iveson@edmonton.ca

April 10, 2018

Infrastructure Canada
180 Kent Street, Suite 1100
Ottawa, Ontario K1P 0B6

Dear Smart Cities Challenge Jury,

On behalf of City Council, it is my pleasure to offer my enthusiastic support for Edmonton's Smart Cities Challenge proposal.

The impacts of poor health on our society are far reaching and well documented. But what role can cities play in reducing the overwhelming costs of health care delivery, tackling chronic diseases and improving the health outcomes of Canadians? The City of Edmonton's 'Healthy City' Smart City application will not only cement Edmonton's place as a leader in healthcare innovation and delivery, it will also demonstrate a future for how Canadian communities can care for their people.

Edmonton is already an influential force within the global healthcare industry. The Health City Initiative I announced in 2016 set out a clear vision to build upon the strength of our robust health assets, creating the best environment possible for health innovation. Our 'Healthy City' proposal directly supports the corporate outcomes as outlined in the City's strategic plans The Way Ahead and Vision 2050.

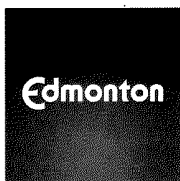
Our proposal will help to address the important issues of community belonging and connectedness – issues which directly impact a person's overall health and well-being. By using data and connected technology to build community belonging and connectedness, we will take a proactive approach to preventing isolation and loneliness, and in the process create healthier, more resilient communities.

I am confident that the skill of Edmonton's Smart Cities Challenge team, combined with the passion and ingenuity of our community, can achieve meaningful and measurable outcomes for Edmontonians. By encouraging collaboration between all orders of government, business, academia, the arts, non-for-profit organizations and most importantly, citizens, we have the opportunity to improve the quality of life for everyone.

I look forward to seeing the innovative activities, partnerships and opportunities that will come out of our response to the Challenge.

Yours truly,

Don Iveson
Mayor



SMART CITIES CHALLENGE

City of Edmonton
Final Proposal
March 2019

smartcities.edmonton.ca



City of Edmonton's Smart Cities Challenge Final Proposal: Executive Summary (long descriptions of figures)

Figure A: Smart City Guiding Principles

A description of five Smart City principles: Resident Focused, Partnerships, Useable Information, Privacy & Security, and Innovation. The principles are accompanied respectively by the following symbols: silhouette of an individual, the world, a cloud with an arrow pointing upwards, a lock and a lightbulb.

Figure B: Smart City Framework

A depiction of the steps in the Smart City Framework: Develop Partnerships, Assess Privacy & Security, Collect Data, Perform Analysis & Storytelling, Take Action and Feedback Loop. The steps are represented respectively by multiple symbols: two people walking/shaking hands, street lights/lock, cityscape/cylindrical layers, ferris wheel/play button, hot air balloon/upward pointing arrows, dotted line.

Figure C: Phased Approach to Building Smarter Cities

Overview of the investment (time and resources) and impact as the program grows. Initiate Phase takes place over 1.5 years with an overall investment of \$10 million and expected low to moderate impact. Innovate Phase takes place over 2 years with an overall investment of \$31 million and expected moderate impact. Embrace Phase takes place over 1.5 years with an overall investment of \$19 million and expected high to transformative impact. This will lead the program into sustaining mode to carry forward on transformative impact.

CITY OF EDMONTON ACCESSIBILITY MATERIALS

CONTENTS

- A. Smart Cities Challenge Finalist Video - *Transcript*
- B. Video Series Featuring 10 Community Leaders - *Transcript*

A. SMART CITIES CHALLENGE FINALIST VIDEO - *TRANSCRIPT*

[0:00 - 2:59]

Bookmarked by the North Saskatchewan river - **Sophie Kim**
This City of ours is a place known for gathering - **Sophie Kim**
It is a collection of indigenous light bearers championing their ancestors - **Ahmed Ali**
and newcomers seeking futures fertile enough to sustain family trees - **Ahmed Ali**

In our birth lands, homes grew stacked- **Sophie Kim**
and so our hands reached upwards.- **Sophie Kim**
So we made camp here, - **Ahmed Ali**
Pioneering robust grounds to a sturdy home.- **Ahmed Ali**
A collection of unfinished poems - **Ahmed Ali**
Resting on the solidity of this landscape, - **Ahmed Ali**
reaching,- **Ahmed Ali**
out to hands that warmed and welcomed. - **Sophie Kim**

We are a network of extended communities -**Ahmed Ali**
full of unspoken leaders - **Ahmed Ali**
who have learned to operate as a team- **Sophie Kim**
finding victory in assisting in each others goals - **Sophie Kim**
So we reach,- **Both**
Reach, because -**Ahmed Ali**
Innovation is not only our vocation - **Ahmed Ali**
It is our inner desire to connect these colors - **Ahmed Ali**
With wires above our heads and rails beneath our feet - **Sophie Kim**
We venture into this darkness - **Sophie Kim**
With fire in our hearts and longing in our hands, - **Sophie Kim**
Innovation is our foundation. - **Both**

When draped in endless darkness - **Ahmed Ali**
and the snow refuses to ease its grip - **Ahmed Ali**
You'll find warmth in the creatives who light our - **Sophie Kim**

hearts with their imagination - **Sophie Kim**
Nearly one million hearts -**Sophie Kim**
Echoing- **Both**
one another.- **Sophie Kim**

This city is big enough to lose yourself in its festivals- **Ahmed Ali**
It's fast growing core and urban parks - **Sophie Kim**
Allures the sleepless child- **Sophie Kim**
And entices the restless soul- **Sophie Kim**
The shifting of its gears, bracing for an eternal drive into the future - **Ahmed Ali**

This city is one of many building blocks of this nation- **Sophie Kim**
The root of the change that brings us together.- **Sophie Kim**
Coast to coast, to coast, we share progress and celebrate success; - **Ahmed Ali**
With a healthier, more vibrant Edmonton - **Ahmed Ali**

We extend our knowledge over mountains and lakes- **Sophie Kim**
Through rolling plains and forests our hands meet - **Sophie Kim**
To elevate the mosaic that makes us all Canadian.- **Both**

This gathering place is a prime example of how cities -**Ahmed Ali**
transform people into selfless citizens -**Ahmed Ali**
Who realize, - **Sophie Kim**
with progression comes the need for preservation - **Sophie Kim**
of these colors, - **Sophie Kim**
the heart(h)s that house these fires,- **Ahmed Ali**
a kindling that survives the volts of changing technology, - **Ahmed Ali**
that resonates within and among us,- **Sophie Kim**
that generates the warmth, the energy - **Sophie Kim**
for this landscape to uproot us, - **Sophie Kim**
for this ground to be solid yet, - **Ahmed Ali**
for these roads to come alive, - **Ahmed Ali**

And for these reaching hands to connect. - **Mayor Don Iveson**

B. VIDEO SERIES FEATURING 10 COMMUNITY LEADERS - TRANSCRIPT

Ahmed 'Knowmadic' Ali

[0:00 - 1:01]

The challenges that I've had being understood made me realize that more often than not, we all have a story, but not all of us are storytellers. And so the reason I love poetry and art is because it does bring people together. That's why I value art and why I value going into communities and not being alone because it does remind me that I have a lot of learning still to do. And we need each other, is another thing, right? Loneliness more often than not arises because we isolate ourselves. We need each other as human beings. We are symbiotic creatures. You have to be around other people to see the beauty within yourself and to accent the beauty within other people. We are naturally community-driven individuals. We are almost like a compass, and this world is the map, and if we don't calibrate ourselves and affirm who we are, we are lost. Share what makes you feel connected.

Cheryl Whiskeyjack

[0:00 - 1:21]

One of the programs that pops in my head is New in Town, which is an Aboriginal welcome service that we started in 2012. And what we're doing there is we're helping indigenous newcomers to the city of Edmonton make it a good and successful transition so that they can succeed in living in the city of Edmonton. Something as simple as how to get from here to there on a bus, what kind of services are available, not wanting to look foolish or dumb or like you don't know what you're doing when it comes to filling out forms or applying for certain services. Where are those places where we can connect? There's a real assumption that because indigenous people are from here that they automatically know what to do, and that's a really bad assumption. It doesn't matter to us who you are. You could be an indigenous person who's new to the city of Edmonton. You could be someone who's been here for 20 years. You could be a non-indigenous person who lives across the street. Everybody is welcome, and it really is a gathering place for people to come and just be together and celebrate. Share what makes you feel connected.

Sgt. David Jones

[0:00 - 1:25]

So a number of years ago I was working on a Build-a-Bike project. It was a community initiative that was really designed to connect kids who were struggling to find their spot in our city. And so I'd been working with this kid for a while. Just jeans, T-shirt, you know the two of us working on this BMX bike project together. One day I showed up as a police officer, you know, you're working different shifts, and I showed up and it was mid-shift and so I got out of the police car and went in with my police uniform on and rolled up my sleeves and threw my radio off to the side, and said, "Okay, where were we again?" So it took him a moment to process what that looked like. Well but you were Dave who was

working on bikes with me last week and now you're a cop. So it took him some time, but after he processed it, it was fun to be able to work through that with him. I'm like, okay so what do you know about police officers? And he'd really had no interaction. So he had probably kind of a negative opinion of police officers before that. And we are able to work through that and understand the why's of that. And have him see that we're just people, working in the community and working on bikes. Share what makes you feel connected.

Erick Ambtman

[0:00 - 1:07]

I came from a place where your value, your family's wealth, dictated where you would end up. Your connections dictated where you would end up. And in Edmonton, it's who you are that leads you to wherever you're gonna go. The only person who can really stop you, or the only person who seems to be willing to stop you in the city is yourself. I've thrived here. I just feel so a part of this community and embedded in this community. There's a recognition in Edmonton that we're all pretty new to this place. Most of us aren't generational. Like, I think it's rare to find somebody in Edmonton who has been here four or five generations. All people in Edmonton are really welcoming. They wanna get to know their neighbors. So for newcomers, I think there's an unusual experience here in that people are really welcoming. And the response when something bad happens in this community to newcomers and wanting them to feel welcome and well treated is remarkable. Newcomers are really fortunate when they choose Edmonton because it's a community that pulls together for them, pulls together for its most vulnerable so often. Share what makes you feel connected.

Glynnis Lieb

[0:00 - 0:59]

When I was a teenager and I had nobody to physically hang out with on a Friday night and I felt lonely, I knew I was lonely, I knew there was nobody around me. And now I think there's a challenge to recognizing that what you're feeling, the dissatisfaction or the sadness, whatever, is actually the fact that you're not connecting. We're human beings, our species is a herding animal we need to be kind of connected to other members. And responding on social media, those kinds of things, don't actually truly connect us to others. What it does often is it further separates because we spend a lot of time on those platforms and not a lot of time, or less time actually, again out and engaging and maintaining relationships and going through the good, the bad and the ugly with other people. Share what makes you feel connected.

John Dowds

[0:00 - 1:22]

I do a fair bit of work in the area of mental health. That's part of my role. I'm a senior mental health consultant and certainly in the research that has been done and continues to be done around isolation and loneliness. Some of the research tells us that the impact of isolation and loneliness on a person's mental health is the same as the impact of somebody smoking two packs of cigarettes a day on their physical health. So the more we recognize how much of an impact loneliness and isolation can have on a person the more we can recognize the need to do something about that. I think as a society we need to do a lot more listening and a lot less talking and in some ways it can be intangible to sit and listen to someone and it may not feel as if we're actually doing an awful lot for them. But, spending time with people and giving them the opportunity to talk as and when they want to and need to and doing that in a way in which hopefully is comfortable for them and supportive for them, makes a huge difference. Share what makes you feel connected.

Keren Tang

[0:00 - 1:14]

When I gave birth a couple years ago, the first few weeks I was really just kind of confined to my own home, following a routine and doing things that I'm learning for the first time. And it was very, very isolating, and it was a transformative experience when I kinda ventured out and participated in a lot of the community programs and services, whether through the public health clinic or the library, and got really connected to a group of young mothers, like myself, in the same situation, facing a lot of the same challenges. And we maintain contact through social media, through Facebook, actually, and continue to form that support network. And it really became a forum for us to share things that are really sensitive, that we don't normally talk about with other people. And on top of that, I've also kinda started connecting with my own cultural community, so that I can find programs and services in my own language, Mandarin, so that my child, who is biracial, can grow up and be surrounded by things that she can relate to her identity or her heritage. Share what makes you feel connected.

Kids in Edmonton

[0:00 - 0:40]

Well, the things that make me feel connected is when people join in and involve themselves.

- I like doing art and science.
- Playing in the park.

- I feel connected when I play baseball.
- I play soccer sometimes with the grade sixers.
- And a bookstore.
- I think it's cool when people join in and try their best at things.
- My family and friends make me feel connected.

Share what makes you feel connected.

City Manager Linda Cochrane

[0:00 - 1:09]

I think this notion of connectedness is way more important than we think it is and way more important than it sounds on a piece of paper because I think we all need it. I think we all want to belong to something or relate to somebody or something and that connectedness is a big part of helping people not feel lonely and there's probably no worse emotion to live with than loneliness. So the idea of connectedness, belonging to a community league or belonging to a church or a community of faith, a community of sport, a community of ethnicity, that's important for people. I think we have a responsibility to invite participation. I don't think it's enough to just offer the programs and have them available. I think we do a much better job than we used to of searching out where people can maybe take part in programs and services by our invitation. So please, share with us what makes you feel connected.

Mayor Don Iveson

[0:00 - 1:20]

You know, I think people who live in rural communities and small towns who all know each other can find connection just by walking down the street, or going to the Co-op. But when you live in a city of a million people, it's actually easier to be alone. You can hide in your place, you can be out in public but not know anyone, unless you happen to bump into a friend. And so social isolation, the bigger a city gets, the more serious a problem it can be. You know, I lived in a different large Canadian city where I didn't know as many people. So I've experienced that big city urban isolation myself. And so I found some connection, I found some community there with those other people who were also kind of fish out of water in this other big city. It's always community and it's always connection, and sometimes it's random circumstance that lifts you out of that. And I think if we just were able to all take it upon ourselves to be open to those conversations rather than fear the unknown, that would contribute to stronger connection, a stronger sense of neighborliness, and strong mental health in our city. Now it's your turn to share what makes you feel connected.

**Page(s) 1394 to 1403
are withheld
pursuant to paragraph
13(1)(d)
of the *Access to Information Act***

**La/les page(s) 1394 à 1403
Font l'objet d'une exception totale
conformément aux dispositions de paragraphe
13(1)(d)
de la *loi sur l'accès à l'information***

Privacy Impact Assessment Smart Cities



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Summary

Review Date

Approvals



Definitions

- **Collection:** To gather, obtain access to, acquire, receive or obtain personal information from any source by any means. Collection occurs when the City obtains personal information from a person or entity other than the City. (i.e Registering for a program)
- **Departmental FOIP Coordinator:** As per the City's FOIP Delegation Order this is the employee appointed to each Department to handle FOIP matters.
- **Disclosure:** To make known or reveal personal information to a person who is not an employee of the City. Disclosure occurs when a City employee shares personal information with a person or entity other than someone working for the City . (i.e. A report to Government funders)
- **Initiative:** Program, service, activity, and project.
- **Personal information:** Recorded information about an identifiable individual, including:
 - the individual's **name, home or business address or home or business telephone number,**
 - the individual's **race or colour, national or ethnic origin, religious or political beliefs or associations,**
 - the individual's **age, sex, marital status or family status,**
 - an **identifying number, symbol or other particular assigned** to the individual,
 - the individual's **fingerprints, other biometric information, blood type, genetic information or inheritable characteristics,**
 - information about the individual's **health and health care history,** including information about a **physical or mental disability,**
 - information about the individual's **educational, financial, employment or criminal history,** including **criminal records** where a pardon has been given,
 - anyone else's **opinions** about the individual, and
 - the individual's **personal views or opinions,** except if they are about someone else
- **Privacy Impact Assessment (PIA):** A Privacy Impact Assessment (PIA) is a process used to identify, assess, and manage risks associated with personal information collected, used, or disclosed as a result of implementing a new or amended initiative or with changing an existing initiative.
- **Use:** To view or manipulate personal information controlled by the City. Use of personal information occurs when an employee sees or changes personal information that has already been collected by the City. (i.e Seeing if someone has taken a class before)



1 The Initiative

Process Step	Determine Name of Initiative
Name of the initiative	Smart Cities

2 Responsible Department

To ensure that privacy risks are appropriately identified and managed it is necessary to identify the department that is responsible for developing the initiative.

Process Step	Define Responsible Department
Name of the responsible department	Corporate and Financial Services, Open City and Technology Branch

3 PIA Lead

The PIA Lead is the individual from the responsible department who represents the department on the PIA Team. A PIA Lead is usually a program manager, lead, or owner.

Process Step	Determine the PIA Lead
Name of the PIA Lead	No PIA Lead identified

4 PIA Team

The PIA Team consists of the individuals who will assist with or take part in the PIA process. The PIA team should include the PIA Lead and the Departmental FOIP Coordinator, but could also include other key sources such as representatives from IT, Records, Law, Corporate Security, or Communications.

Process Step	Determine the PIA team
PIA Team Members	Director Smart Cities Submission, Consultant Information Privacy and Security, Information Architect, Director of Corporate Information, Principal Information Manager

5 Scope of the PIA

Provide a high level overview of the scope of the PIA. This section should answer the question: what is this PIA about.

Process Step	Determine scope of the PIA.
--------------	-----------------------------



Describe: <ul style="list-style-type: none"> • What is in scope for the PIA • What is out of scope for the PIA 	<ul style="list-style-type: none"> • What the PIA is assessing.
<p>The scope of this PIA is assessment and management of risks associated with Phase I of the Smart Cities initiative. This PIA will not address assessment and management or risks associated with future phases of Smart Cities. Future phases will be assessed in accordance with the City's privacy standards and amendments to this PIA will be made as required.</p> <p>The purpose of this PIA is to demonstrate that Phase I of the Smart Cities initiative will not entail collection, use, or disclosure of personal information.</p> <p>This PIA does not assess privacy risks associated with collection of data that has been gathered and made available in open data. It is an assumption of Smart Cities that existing procedures to review open data sets prior to their inclusion in open data are sufficient. The City's open data catalog has been in operation since 2015.</p>	

6 Implementation Date

In order to ensure that risks have been identified and managed, the date of implementation for the initiative should occur after a privacy impact assessment has been completed.

Process Step	Determine when the initiative will be implemented	
Note: If the initiative has several phases identify the dates of each phase		
Phase I is slated to begin in Spring of 2019. Future phases of the Smart Cities initiative will occur in the next five years.		

7 Stakeholders

Stakeholders are those individuals or entities who have a vested interest in privacy impacts of the initiative. Stakeholder groups may include the public, senior management, Council, City committees, City staff, other public bodies, service partners, and Alberta's Office of the Information and Privacy Commissioner.

Process Step	Determine stakeholders and their feedback regarding privacy. Identify how feedback has been incorporated into the initiative. Include:
Describe: <ul style="list-style-type: none"> • Who the stakeholders are 	



<ul style="list-style-type: none"> ● The role of stakeholders ● How stakeholders were identified 	<ul style="list-style-type: none"> ● Thoughts, opinions, support, direction and/or recommendations they have provided ● How feedback has been integrated into the initiative
<p>Stakeholders for the initiative include:</p> <p>Internal:</p> <ul style="list-style-type: none"> ● Council: reports on Smart Cities have been received by Council. ● Executive Leadership Team: The Executive Leadership Team is ultimately responsible for the operation of the Smart Cities initiative. ● City Clerk: The City Clerk is responsible for privacy at the City and compliance with the Freedom of Information and Protection of Privacy Act. <p>External:</p> <ul style="list-style-type: none"> ● Infrastructure Canada: Infrastructure Canada is sponsoring the Smart Cities challenge. ● Office of the Information and Privacy Commissioner: As part of submission requirements for the Smart Cities challenge, the City is required to submit this PIA to the OIPC for review and comment. ● Citizens: citizens will access data sets, created during the Smart Cities Phase I, on Open Data. <p>Note:</p> <p>Future phases of the Smart Cities challenge will include a wider stakeholder group. Future phases of Smart Cities contemplate partnerships with health care organizations and community groups.</p>	

8 Approvers

Standard approvers for a PIA are the Departmental FOIP Coordinator, the PIA Lead, OCC FOIP, and a Director level or higher must also sign off on the PIA. If other roles are also identified to sign off the PIA, remember that a PIA is a document that assesses privacy risks associated with an initiative being implemented by the City, and an external party (like a partner organization or contractor) must not be given authority to sign off on a PIA. As well, the greater the number of approvers the longer the approval process.

Process Step	Determine if anyone other than standard approvers will approve PIA.
<p>Describe:</p> <ul style="list-style-type: none"> ● Who was selected to approve the PIA ● The rationale for selecting approvers 	<ul style="list-style-type: none"> ● How feedback from each approver was integrated
<p>Note: Add department level signature lines to approval pages</p> <p>The City Clerk is the approver of this PIA. In accordance with the City's City Administration Bylaw, and the City's FOIP Delegation Order, the City Clerk approves privacy impact assessments.</p> <p>Typically the Director of Corporate Information approves PIAs, but as the Director is the primary writer of this PIA, the City Clerk is required to approve this PIA to ensure an objective review of the assessment.</p>	



9 Department Level Benefits of Conducting a PIA

This section of the PIA should describe the purpose of completing the PIA. One of the purposes of conducting a PIA is to demonstrate that an initiative complies with legislation (FOIP). Another purpose is to demonstrate to stakeholders that privacy risks have been identified and appropriately managed.

Process Step	Determine the value added benefits that the department can realize by conducting the PIA process for this initiative such as: <ul style="list-style-type: none">• Ensuring the process is effectively streamlined• Reducing costs and/or time to complete the initiative• Increase staff confidence in processes impacting privacy
Describe: <ul style="list-style-type: none">• The expected benefits for the department for completing the PIA.	<ul style="list-style-type: none">• Benefits to others outside the department
<p>The primary benefit of conducting a PIA during the first phase of Smart Cities is the assurance that privacy principles guide future phases of the Smart Cities initiative. Future phases of Smart Cities will entail significant privacy risks, and it is important that, from the outset of this initiative, privacy is a focus.</p> <p>Smart Cities will also benefit from the OIPC's review of this PIA. It is hoped that review will identify potential gaps and risks, and/or confirm that safeguards for Phase I are sufficient.</p>	

10 Legislation Identification

One of the purposes of conducting the PIA is to demonstrate that the initiative is in compliance with all relevant legislation. In most cases, the initiative will only need to demonstrate compliance with FOIP, but other pieces of legislation may intersect with FOIP and become relevant. When an initiative involves more than FOIP legislation, it is necessary to consult with Law Branch.

Process Step	Consider all legislation relevant to the initiative.
List and provide links to: <ul style="list-style-type: none">• The relevant legislation	Describe: <ul style="list-style-type: none">• If relevant, how the legislation intersects with FOIP• Considerations of paramountcy
<p>Relevant legislation includes: <i>The Freedom of Information and Protection of Privacy Act</i> The City has a duty to protect the personal information it collects, uses, and discloses.</p>	



11 Bylaws, Policies and Procedures Identification

One of the purposes of conducting the PIA is to demonstrate that the initiative is in compliance with all existing City bylaws, policies and procedures that pertain to FOIP. [One City, Policies and Directives](#) can be found here.

Process Step	Consider all relevant City bylaws, policies and procedures
List and provide links to: <ul style="list-style-type: none">• The relevant bylaws, policies, procedures and directives	Describe: <ul style="list-style-type: none">• How existing bylaws, policies, and procedures are relevant to the initiative
<p>Orders FOIP Delegation Order establishes role of City Clerk as FOIP Head for the City of Edmonton, and is responsible for privacy at the City</p> <p>FOIP Delegation Order establishes delegations for privacy for the Corporate Access and Privacy Office, Office of the City Clerk.</p> <p>Policies <u>Policy C581 - Open City</u>: Articulates that, subject to FOIP, all City Data is open</p> <p>Directives:</p> <ul style="list-style-type: none">- <u>Administrative Directive A1433A - Privacy</u> - Articulates the requirement to protect personal information, including conducting privacy impact assessments- <u>Administrative Directive A1445 - Privacy Breach</u> - Articulates the requirement to report privacy breaches	

12 Initiative Definitions and Acronyms

Provide pertinent definitions and acronyms that will be used when describing this initiative

Process Step	Identify pertinent abbreviations, acronyms and definitions

13 Project Summary

Provide a summary of the project; a high level overview of the initiative.

Process Step	Provide a project summary
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Note:

- A project summary is a good source for this information.

In the fall of 2017, Infrastructure Canada issued a challenge to every community across the country, encouraging them to adopt a smart cities approach to improve the lives of residents through innovation, data and connected technology. Out of the several other municipalities in the \$50 Million category, Edmonton was announced as one of five finalists on June 1, 2018.

Currently in the finalist round, the Edmonton Smart Cities Challenge Team is working towards a final proposal that will be submitted to the Federal government: a plan that builds on the first round's aspirational application and sets out concrete plans to achieve real results for our residents through a smart cities approach.

A foundational element of the Healthy City program is to be able to share anonymized data and information across the Healthy City Ecosystem in order to consolidate disparate data and identify gaps and biases. The City and its partners have significant and valuable amounts of open data. The use of this data can be optimized through the ecosystem to enhance the development and delivery of programs and services for residents as well as enhance and animate the physical spaces they occupy. During the initial phase of implementation, the Healthy City program will focus on maximizing the use of open data across the ecosystem, including that which is currently available publicly through Edmonton's Open Data Catalogue.

The Open Data Catalogue includes numerous datasets, broken down into categories such as City Administration, Community Services, Demographics and Transportation. Datasets are also available by City Department. All data in the Open Data Catalogue is publicly available and has been obtained and published under Open Data processes. These processes include steps to ensure both Freedom of Information and Protection of Privacy, and other legal requirements are met. The Open Data Catalogue also makes available datasets comprised of data from external bodies such as the Edmonton Police Service, Edmonton Public Library, Alberta Environment and Parks, and EPCOR.

Smart Cities will be implemented in three phases. The first phase will begin with the development of a register of open datasets within the Healthy City Ecosystem available for collaborative use. This will enable the collaborative identification of potential projects and allow for data to be analyzed with the intent to discover useful information, form the foundation for solutioning, and, ultimately, support decision-making.

As the program progresses, it is anticipated that projects or initiatives will be identified where collection, and use of personal information will be necessary to support research. In this secondary phase, the City, along with its partners would assess what data is necessary for the research purpose. If all parties agree, an agreement would be created between parties and the City. Any agreements created would meet the requirements of FOIP and identify clauses relating to custody and control, privacy breach response, safeguards, and retention and disposition of data.

Phase three of Smart Cities will entail establishing a repository to host Healthy City data. This repository would potentially consist of both aggregate and identifiable data. The vendor selected to host the data, if the data is hosted outside of the City, will need to meet the City's contractual and procurement requirements, and information security and privacy requirements. It is assumed that a separate repository will allow for enhanced security controls such as data segregation, role-based access control, and auditing and monitoring.

In summary, the intent is of Smart Cities Phase I is not to collect, use, or disclose personal information. The use of data by Smart Cities during Phase I will be data which has already been collected and has been made available on the City's Open Data portal. While some data sets on Open Data contain personal information, Smart Cities will not use these data sets. Data sets that are created as a result of combining data sets will not result in permanent creation of data sets that contain personal information. If combining data results in the creation of personal information, the data set will be modified to remove personal information or de-identify personal information or data will be further aggregated.

14 Rationale

Identify why this initiative is needed at the City including the benefits to the City. If the initiative represents a change to an existing process include the reason why a change is required as well as a description of the current state and the intended future state. Include a description of how the benefits of the initiative outweigh any potential risks to personal privacy. This is an extremely important section of the PIA because it should clearly demonstrate that the initiative is needed despite risks to personal privacy.

Process Step	Develop a rationale for proceeding with the initiative
Describe: <ul style="list-style-type: none"> • Why the initiative is needed • The benefits of the initiative • The trigger for change 	<ul style="list-style-type: none"> • The current/past state and the planned future state • How the benefits outweigh risks to personal privacy
<p>Municipalities play a vital role in contributing to the health of their residents. The City of Edmonton proposes to improve the health of residents by addressing the root causes of health issues. With the recognition that preventive health services need to be responsive to the unique needs of all residents, the City has created an approach that is resident-driven, evidence-based and will be delivered in partnership with communities. From a municipal perspective, addressing social determinants of health such as</p>	



isolation and access to services in this collaborative setting is an innovative, transformational approach to achieving preventive health outcomes.

It is the City's position that municipal-level interventions have the potential to result in a healthier city, and ultimately improve the quality of life for residents. In order to improve quality of life for residents, Edmonton's Smart Cities Challenge proposal is focusing on increasing connectedness and sense of belonging, and decreasing loneliness in our city.

It is hoped that implementation of all phases of Smart Cities will result in the following outcomes:

1. Advance the Health City Ecosystem - the City of Edmonton will advance the development of the Healthy City Ecosystem to work collaboratively to provide integrated community-based preventative health support. The Healthy City Ecosystem comprises public sector organizations, private sector organizations, academic institutions and residents. The ecosystem works collaboratively to improve the capacity of all partners while developing efficient and significant ways to provide meaningful services to residents. This will continue by identifying partnerships, opportunities for innovation and the means by which to improve the efficacy of preventative health services.
2. Establish an Information Sharing Framework - the City of Edmonton is developing an actionable framework that will facilitate the sharing of anonymized data and information across the Healthy City Ecosystem in order to understand the current state of data existence and completeness. This framework will be developed in conjunction with residents, community members and partners and will focus on understanding how data and information can be used to help identify and solve problems.
3. Lead Projects to Improve Health and Well-Being of Residents - the City will lead projects that positively impact the health and well-being of residents. The City envisions a community that thrives and is united, not divided, by data, information and digital technologies. Edmonton is a city for all, connected and healthy. When health programs are delivered to their maximum benefit, every Edmontonian and the city as a whole thrives.
4. Establish a Municipal-Focused Digital Innovation Collective - the City of Edmonton will lead the development of a municipal collective for digital innovation across Canada in order to transform the use of data and connected technology for more effective decision-making. This transformative approach will ensure replicability and scalability of processes and solutions across Canada.

In order to achieve these actions, the City will work with partners to break down traditional barriers to improving the development and delivery of policies, programs and services in Edmonton, a model that can be applied to all Canadian municipalities.



15 Governance Model

In order to understand responsibility for the management of privacy risks, accountability for the initiative must be established. Establishing governance is particularly important when working on a multi-stakeholder or multi-partner initiative. All partners must understand roles and responsibilities.

Process Step		Identify the governance model for the initiative
Describe: <ul style="list-style-type: none"> Who is accountable for the initiative Governance model 	List or link: <ul style="list-style-type: none"> Organization charts, organization plans, memorandums of understanding and applicable agreements 	<p>Note: This chart reflects the Governance Structure for Phase I Smart Cities. Future phases will include a wider governance group with external members.</p>
Individual or Group	Description and Membership	Roles and Responsibilities
Executive Leadership Team	ELT is the senior most governance committee of the City and includes Deputy City Managers of all Departments and the City Manager.	<ul style="list-style-type: none"> Accountable to Infrastructure Canada for the City of Edmonton's progress and achievement of outcomes. Approve membership of the Steering Committee. Advocate for the program.
Chief Information Officer	The individual responsible for overseeing the Smart Cities program.	<ul style="list-style-type: none"> Decision-making authority for prioritizing investments for the program and projects. Approve allotment of resources to specific projects and initiatives and



		<p>any delegation of authority within the program.</p> <ul style="list-style-type: none"> • Oversee strategic and operational risk program and ensure appropriate mitigation strategies are in place.
Steering Committee	<p>A committee comprised of internal and external leaders who can advance the strategic vision of the Healthy City program.</p> <p>A combination of up to 4 community leaders and up to 4 City of Edmonton Senior Managers representing diverse departments.</p>	<ul style="list-style-type: none"> • Share the vision for a Healthy City and provide guidance to the Program Team. • Provide strategic oversight to the advisory groups. • Provide recommendations on projects to be implemented and resource allotment. • Identify potential program or project risks.
Data and Privacy Advisory Group	<p>An advisory group comprised subject matter experts in the field of information and data privacy and security to guide the Healthy City program implementation.</p> <p>Director, Information Ethics, City of Edmonton Director, Corporate Access and Privacy, City of Edmonton Chief Information Security Officer, City of Edmonton Legal Representative, City of Edmonton</p> <p>Membership will be approved by the Steering Committee and reviewed on an annual basis.</p>	<ul style="list-style-type: none"> • Share the vision for a Healthy City. • Review and provide feedback on information and research agreements, data sharing agreements • Provide recommendations regarding privacy and security to the Steering Committee. • Provide oversight to ensure all privacy and security procedures are as per industry standards and legislative requirements. • Identify information risks and ensure that risks are routed to appropriate program areas for review and mitigation • Advocate for the program.



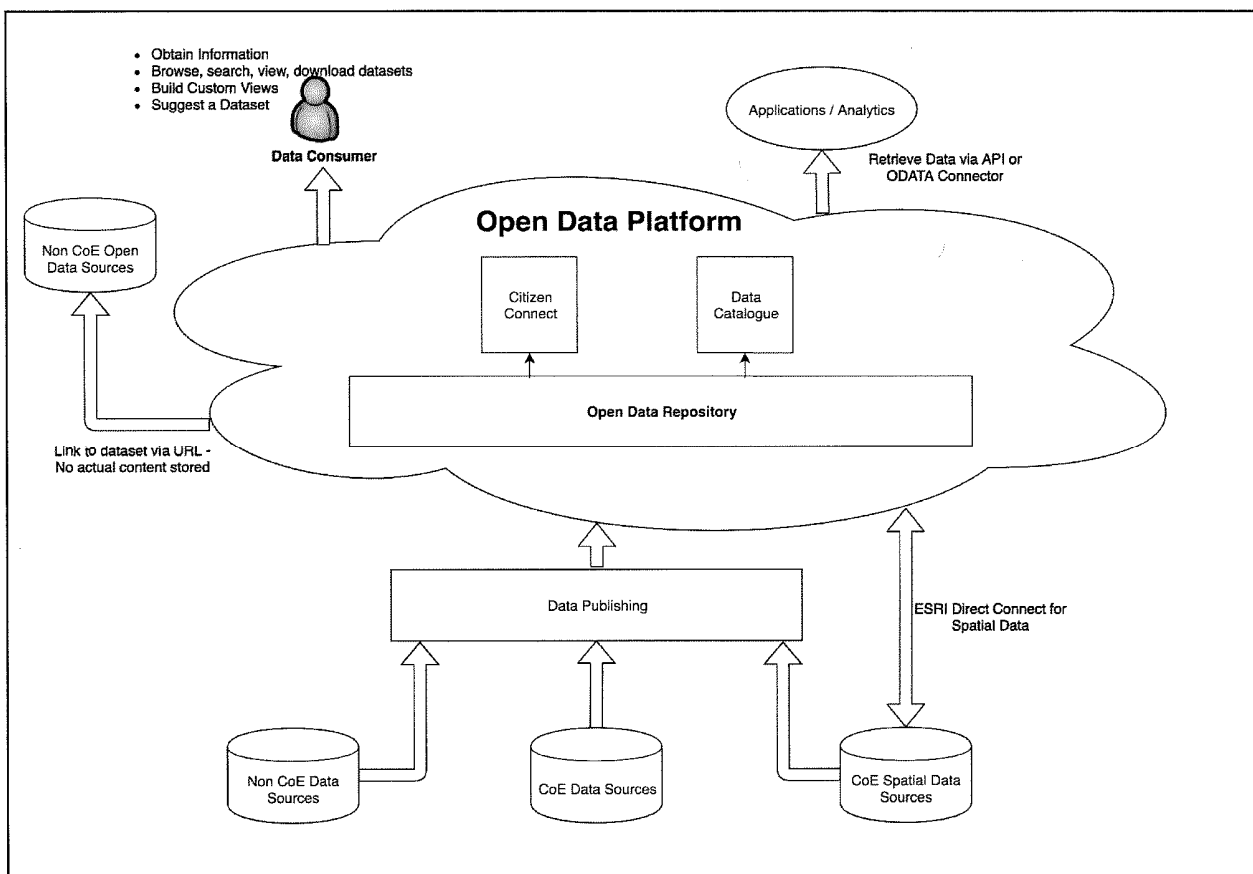
Innovation and Technology Advisory Group	<p>An advisory group comprised of internal subject matter experts in the field of technology innovation.</p> <p>Members of these advisory groups will be appointed for one year terms with the opportunity to renew for one additional term.</p> <p>Membership is reviewed by the Steering Committee on an annual basis.</p>	<ul style="list-style-type: none"> ● Share the vision for a Healthy City. ● Provide advice regarding specific area of expertise to the Steering Committee and individual project teams on an ongoing or as-needed basis. ● Help identify privacy and security concerns. ● Help identify and mitigate potential program or project risks. ● Provide constructive feedback to the Healthy City Program Implementation Team.
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16 Technical Infrastructure

Technical infrastructure means the technological components (hardware, software, network, users) established to move information through a system. A technical diagram should show how information moves through the pieces of technical infrastructure.

Process Step	Provide a diagram of the technical infrastructure
Describe: <ul style="list-style-type: none"> ● Provide a text description of the diagram 	Attach: <ul style="list-style-type: none"> ● Drawing of the technical infrastructure





The Open Data Platform is a cloud based solution hosted by Socrata. Data is extracted, transformed (cleansed) and loaded (ETL) via Feature Manipulation Language (FME). This data is then published to the Open Data Repository and included in the Data Catalogue.

The Datasets will be accessed from the Open Data Catalogue using an Application Programming Interface (API) and brought into the Extract, Transform, Load (ETL) tool into the Merged Dataset. The Transformation rules will be applied to the Merged Dataset in order to determine if any data needs to be removed, masked or anonymized. After removing the appropriate data from the Merged Dataset, it will be saved into the Cleansed Merged Dataset within the Open Data Catalogue. Appropriate access to the Cleansed Merged Dataset will be granted to the Analytics engine. Any data that has been removed based on the rules will be deleted.

17 Flow of Information

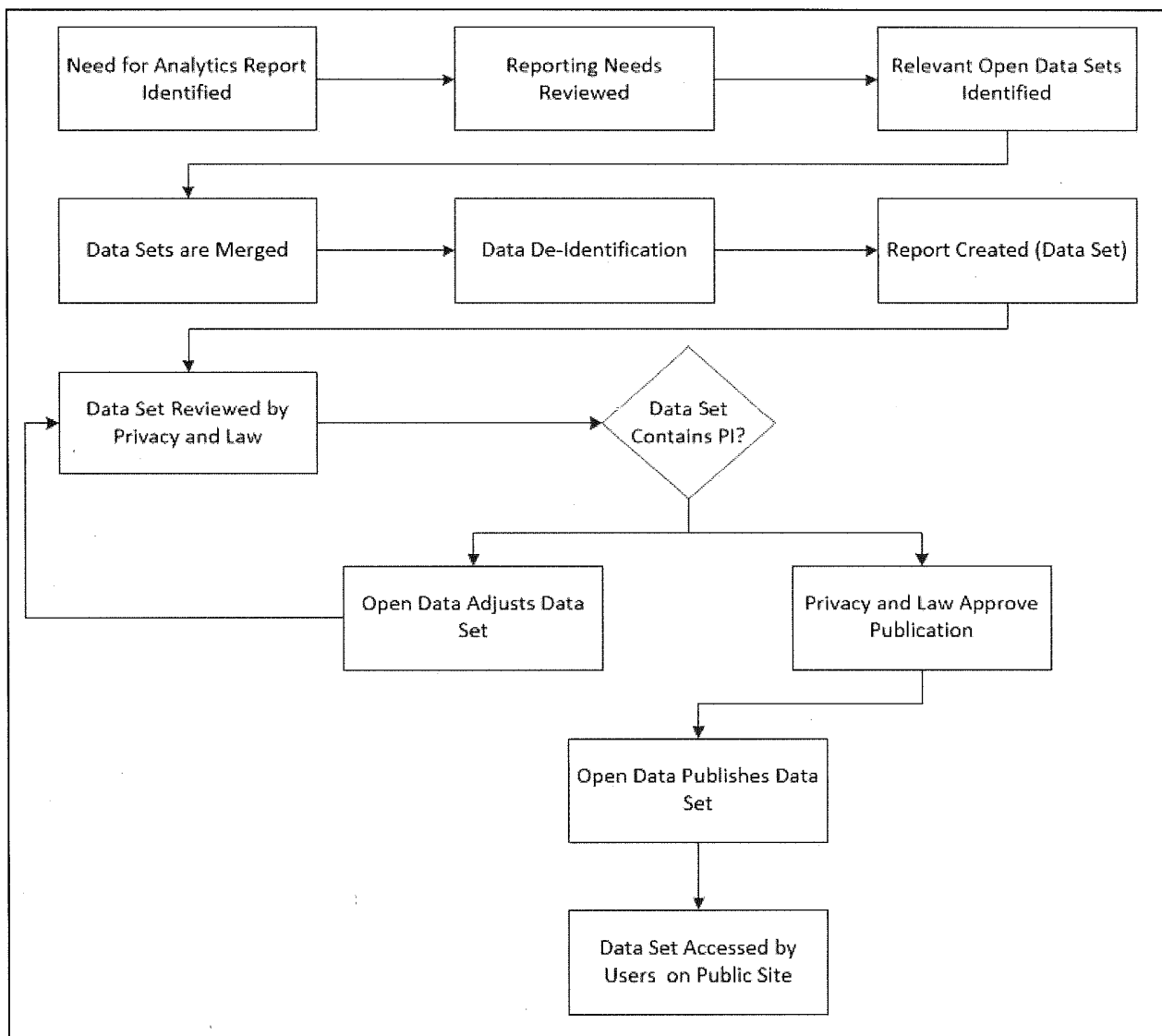
A flow of information is the foundation of a PIA. A flow of information identifies how personal information moves from the point of collection to disclosure.

Process Step	Determine flow of information
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Completed by	PIA Lead, PIA Team, OCC FOIP can facilitate the mapping
Map: <ul style="list-style-type: none"> • What information is collected • How the information is collected • What happens to the information after it has been collected, who uses it, how it is used, the purpose for which the information is used • If information is disclosed to individuals outside of the City, the method of disclosure, to whom the information is disclosed, the purpose for which the information is disclosed. 	Attach: <ul style="list-style-type: none"> • A flow chart of the flow of information and provide a textual description of the flow chart.
Note: This step is the foundation for the rest of the Privacy Impact Assessment (PIA). The remainder of the PIA cannot be completed without documenting the flow of information.	





Smart Cities Phase I Flow of Information

Below is the flow of information for Smart Cities Phase I. The flow of information will be expanded for future phases of Smart Cities.

1. Need for Analytics Report Identified

The need for data is triggered by internal requests from business areas in the City who are engaged in a project that would benefit from data analysis and analytics.

2. Reporting Needs Reviewed

Projects are reviewed by the various governance teams as required including the Smart Cities project team, the Healthy City Governance Committee, Business Technology Working Group (Branch managers



and heads of branches in the CoE Administration), and the Technology Investment Advisory Group (Directors across the corporation who lead business units within branches)

Projects are reviewed and decisions to approve are based on criteria that include relevance to the Smart Cities objectives, business readiness and strategic alignment with City's vision, privacy, Information security, innovative ability, data architecture and alignment to principles of the corporations business technology strategy.

Projects are approved and all requests for resources are assigned a tier based on complexity, value and scope of request. Once approved, a project specific management team will be established to oversee the project planning implementation and reporting. It will be through this project design that they data requirements will be established and the necessary liaison with data, technical and privacy resources will take place prior to any work proceeding.

3. Relevant Open Data Sets Identified

Once a project has been approved, the Smart Cities team reviews a listing of all of the available data sets to determine which data sets would be useful in resolving the business area's data needs.

Scenario Example: The City's Transit Department wants to determine if a route change is required in the Beverly neighbourhood due to inactivity (or empty buses) between the hours of 9pm and midnight. If the hypothesis were that poor lighting was influencing ridership, the Smart Cities team would review data sets to identify the most relevant data sets with keywords such as "transit" "routes" "lighting".

4. Data Sets are Merged

Once data sets have been selected, the data sets are merged by the Data Engineer/Analyst using an Extract, Transform, Load (ETL tool) like SafeSoft FME (Feature Manipulation Engine). This is the tool that is currently used to create data sets within the Open Data Catalogue.

5. Data De-Identification

If combination of the data results in the creation of a data set that contains personal information, the data sets will be automatically modified. The ETL Tool will be programmed to only create data sets that do not contain personal information. For example, the tool will not create data sets to sample sizes of less than 20 or only to "neighbourhood" level.

6. Report Created

The new data set is created by a Data Analytics Developer.

7. Data Set Reviewed by Privacy and Law

The Data Analytics Developer provides the data set to the Open Data Privacy group which includes the City Clerk's Office as the delegated authority to make decisions regarding use of personal information. All



data sets are reviewed by this group before they are uploaded to open data. This group performs a manual review of data sets to ensure that data sets do not contain personal information.

8. Open Data Publishes Data Set

Once a data set has been approved for publication by the Open data privacy group, the data set is loaded onto Open Data.

9. Data Sets Accessed by Users on Public Site

The business area that requested the data and any external user accesses the new data set on Open Data. If the newly created data set does not result in useful data, the process will begin again to try to satisfy the business area's needs.



Part 2 - Collection of Personal Information

Part 2 is not required if the initiative will not result in the collection of new personal information and only existing personal information will be used.

The remaining parts of the assessment **cannot be completed** without the **Flow of Information map from Part 1.**

Collection: To gather, obtain access to, acquire, receive or obtain personal information from any source by any means. Collection occurs when the City obtains personal information from a person or entity other than the City. (i.e Registering for a program)

In the FOIP Act all of Part 2, Division 1, Sections 33 - 38 pertain to collection of personal information. It identifies:

- The authority to collect personal information
- From whom personal information may be collected
- The City's responsibility to ensure the accuracy of the information collected
- The requirement to protect information that has been collected

Part 2 is not applicable for this PIA; the sections of this template that pertain to collection of personal information will not be completed for this PIA are left intentionally blank. The scope of this PIA (Phase I of Smart Cities) is the use of existing data sets by the Smart Cities initiative, not the collection of data for data sets. An operational assumption of Smart Cities is that existing Open Data processes have addressed and mitigated any potential privacy risks prior to their publication on open data.

Future phases of Smart Cities will entail the collection of personal information from third parties such as health authorities, educational bodies, and community organizations. Prior to collection of personal information, this PIA Template will be updated and Part 2 will be completed.



1 Authority for Collection

Identify the authority for collection of personal information needed for the initiative. Section 33 states that no personal information may be collected by or for a public body unless:

- (a) the collection of that information is expressly authorized by an enactment of Alberta or Canada,
- (b) that information is collected for the purposes of law enforcement, or
- (c) that information relates directly to and is necessary for an operating program or activity of the public body

Process Step	Identify the authority for the collection
Identify: <ul style="list-style-type: none">• Section a, b or c	<ul style="list-style-type: none">• If section a is the authority include the authorizing enactment
Note: The authority for most initiatives is 33(c)	
Section:	

2 Collection of Personal Information

Process Step	Determine what personal information must be collected to support the initiative, who is conducting the collection, from whom the information is being collected and what the purpose for the collection is.
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Completing Table A - Collection of Personal Information (Next Page)

Using the Flow of Information Map from Part 1

Column 1 - Personal Information Collected:

- List each specific piece (element, type) of personal information separately
- Include all pieces that are collected throughout the entire process
- Refer to the definitions for clarification of personal information
- Include any elements that can be used to identify an individual

The only personal information that should be collected is the personal information that is required to operate the initiative:

Ask the following questions:

- How would the process change if you did not have this particular piece of information; would the process become ineffective
- Is this piece of information absolutely necessary
- Is it collected in the least sensitive format possible (i.e instead of birthdate would age or year of birth reach the same purpose)



Column 2 - Who is collecting the information:

- Identify which roles, on behalf of the City, are collecting the information.

Note: The only role that should be collecting the information is the role that needs the information

Column 3 - Who is providing the information:

- The answer to this question should almost always be: the person to whom the information relates.

Column 4 - Purpose of the Collection:

- Identify why each piece of information is needed and what it will be used for (i.e age range is needed in order to ensure child is registered in appropriate class)

Table A - Collection of Personal Information

Personal Information collected	Who is collecting the information	Who is providing the information (include exception references* if applicable)	Purpose of Collection
I.e. Name	I.e Front Clerk	I.e. Registrant	I.e To identify the registrant's account

* If the person providing the information is not the person to whom the information is about please refer to section 34 of the [FOIP Act](#) and identify which section (A - O) allows the exception. Write the section number in the same cell above where the exception is identified.

3 Special Requirements for Collection via Surveillance Cameras

(This section only to be completed if the initiative involves video surveillance)

If the initiative involves video surveillance review City Directive A1435.

Process Step	Identify that special requirements for the use of surveillance cameras have been addressed
Describe:	Include:



<ul style="list-style-type: none"> How the initiative complies with the Directive Identify: <ul style="list-style-type: none"> Location of each camera What each camera is recording Purpose of positioning the camera in the selected location 	<ul style="list-style-type: none"> City's retention and classification recommendations for retaining, storing and destroying tapes Attach: <ul style="list-style-type: none"> Video surveillance log

4 Notification - FOIP Statement

When information is collected directly from an individual, the individual has a right to be informed about the purpose for collection. Notification must identify the purpose for collection, the legal authority for collection, and contact information for an employee of the City who can answer questions about the collection.

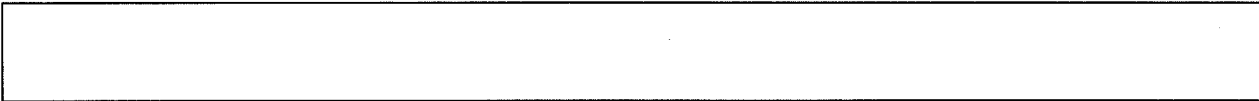
Process Step	Create the notification - FOIP statement
Using: <ul style="list-style-type: none"> Complete the sentence in last box providing your FOIP Statement 	<ul style="list-style-type: none"> Describe how you will make this statement known to those you are collecting the information from
Note: Only those items in bold can be modified Call centre numbers are not acceptable for contact information, nor is an email address	
Example: Your personal information is being collected [used or disclosed] for the purpose of registering you in program [x] . This information is collected pursuant to section 33(c) of the FOIP Act. If you have any questions about this collection, please contact [employee title] at [phone number and business address] .	
Your personal information is being collected. ...	

5 Frequency and Duration of Collection

Personal information should be collected only as often as necessary to support the initiative. (i.e A survey that is happening yearly or an ongoing basis)

Process Step	Identify how often the information will be collected
Describe: <ul style="list-style-type: none"> How often information will be collected. 	<ul style="list-style-type: none"> The period of time information will be collected.





6 Retention and Destruction Requirements

Using the City's Classification and Retention Schedule identify which classification, retention and disposition requirements apply to the information collected.

Process Step	Identify which classification series applies.
Identify: <ul style="list-style-type: none">• Where the information will be saved; which information series applies• How long the information will be kept beyond the end of year	<ul style="list-style-type: none">• If the information will be destroyed, deleted OR if archives has identified it as information of interest Attach: <ul style="list-style-type: none">• Information series from the City's Classification and Retention Schedule
Note: If a long term retention is required, describe the plan for ensuring continued access to the information	



Part 3 - Use of Personal Information

Use of personal information: To view or manipulate personal information. Use of personal information occurs when an employee sees or changes personal information that has already been collected by the City. (i.e. reviewing a database to see if someone has registered for a program)

In the FOIP Act Part 2, Division 2, Sections 39 and 41 direct how the City can use personal information it has collected. It identifies that we can only use personal information for a few specific purposes.

Many sections of Part III of this PIA are not relevant to Phase I of the Smart Cities initiative. While assessing use of personal information is within the scope of this PIA, the purpose of Phase I of Smart Cities is not to use personal information. Any use of personal information is inadvertent, and any personal information created will be destroyed upon identification of personal information and will not be retained.

Future phases of Smart Cities will entail the use of personal information. Personal information will be used for analytics purposes to create data sets. Prior to use of personal information, this PIA Template will be updated and Part 3 will be completed.

The logo for the City of Edmonton, featuring the word "Edmonton" in white text on a black rectangular background.

1 Authority for Use

Identify the authority for the use of personal information needed for the initiative. Section 39(1) states that a public body (City of Edmonton) may use personal information only

- (a) for the purpose for which the information was collected or compiled or for a use consistent with that purpose,
- (b) If the individual the information is about has identified the information and consented, in the prescribed manner, to the use, or
- (c) For a purpose for which that information may be disclosed to a public body under section 40, 42 or 43 (see the [FOIP Act](#) for these sections)

Process Step	Identify the authority for the collection
Identify: <ul style="list-style-type: none">• Subsection a, b or c	<ul style="list-style-type: none">• If subsection b is the authority see section below on consent for use *
Note: The authority for most initiatives at the City is 39(1)(a).	
<p>Section: No authority for use of personal information is required. The purpose of Phase I of Smart Cities initiative is not to use personal information. Any use of personal information is inadvertent, and any personal information created will be destroyed upon identification of personal information and will not be retained.</p> <p>While some data sets on open data contain personal information, these data sets will not be used by the Smart Cities initiative.</p> <p>In future phases of Smart Cities, partner organizations that provide personal information to the City will be required to demonstrate that either consent was gained for disclosure to the City for the purposes of Smart Cities or legislative authority exists to disclose to the City for the purposes of Smart Cities.</p> <p>Smart Cities will employ the following analytics methodologies:</p> <ul style="list-style-type: none">• Data Clustering: The process of making a group of data into classes of similar objects.<ul style="list-style-type: none">○ A cluster of data objects can be treated as one group○ While doing cluster analysis, we first partition the set of data into groups based on data similarity and then assign the labels to the groups○ The main advantage of clustering over classification is that clustering is adaptable to changes and helps single out useful features that distinguish different groups• Data Matching: The efforts to compare two sets of collected data. This can be done in many different ways, but the process is often based on algorithms or programmed loops, where processors perform sequential analyses of each individual piece of a data set, matching it against each individual piece of another data set, or comparing complex variables like strings for particular similarities	

- **Data Mining:** The process of analyzing data from different perspectives and summarizing it into useful information - information that can be used to increase revenue, cuts costs, or both. Data mining software is one of a number of analytical tools for analyzing data. It allows users to analyze data from many different dimensions or angles, categorize it, and summarize the relationships identified. Technically, data mining is the process of finding correlations or patterns among dozens of fields in large relational databases.
- **Advanced Analytics:** The autonomous or semi-autonomous examination of data or content using sophisticated techniques and tools, typically beyond those of traditional business intelligence, to discover deeper insights, make predictions, or generate recommendations.

*** Consent for Use - Section 39(1)(b)**

If consent is the authority for use, complete this section.

Process Step	Develop consent process.
Identify: <ul style="list-style-type: none"> ● Why consent is needed ● If consent is implied or expressed and rationale ● If consent is oral, electronic or written and rationale ● How consent will be obtained ● Who will obtain consent 	<ul style="list-style-type: none"> ● Additional training if required ● How the consenting individual will be verified ● How consent may be revoked by the individual Attach: <ul style="list-style-type: none"> ● Consent form/statement ● Consent procedure ● Training materials
<p>Consent for use of personal information is not required because personal information will not be used by Smart Cities during Phase I.</p> <p>In future phases of Smart Cities, partner organizations that provide personal information to the City will be required to demonstrate that either consent was gained for disclosure to the City for the purposes of Smart Cities or legislative authority exists to disclose to the City for the purposes of Smart Cities.</p>	

2 Use of Personal Information

Process Step	Determine which personal information must be used/accessed to support the initiative, who is using or accessing the information, how the information is being used or accessed and the purpose for access.
Completing Table B - Use of Personal Information (Next Page)	



Using the Flow of Information Map from Part 1

Column 1 - Personal information used:

- List each specific piece (element) of personal information separately
Tip: Copy the table from Part 2 if you have completed Part 2.
- Include all elements that are used throughout the entire process
- Refer to definitions.
- Include any elements that can be used to identify an individual

Column 2 - Who is accessing or using the information:

- Identify the role using each information element (i.e Program facilitator needs to access registrant names to issue certificates for those who complete)

The only personal information that should be used is the personal information that is necessary.

Ask the following questions:

- How would the process change if this particular piece of information was not available at this access point? Would the process become ineffective?
- Does this person/group/system absolutely need this information to do their job?

Column 3 - Source of Information

- Identify who is providing the personal information and identify the data source from which the personal information is being used.

Column 4 - Purpose of the Use:

- Identify the purpose for using the personal information

Note: If there is no "Use" for an item copied and pasted from Table 1 in Part II, does the element need to be collected?



Table B - Use of Personal Information

Personal Information used	Who is accessing or using it	Source of Information	Purpose of Use
I.e. Name	I.e Program Instructor	I.e. Report from CLASS and information collected from registrant	I.e Generate Certificates

This chart is left intentionally blank. Personal information will not be used as part of Phase I of Smart Cities.

3 Frequency and Duration of Use

Personal information should be used or accessed only as often as necessary and only for the time period necessary to support the initiative. (i.e. Instructor needs access only as long as the class is running. Access will be removed once certificate has been generated or 2 weeks after the program is complete.)

Process Step	Identify how often the information will be used and the period of time for which it will be accessed.
Describe: <ul style="list-style-type: none"> How often this information will be used or accessed 	<ul style="list-style-type: none"> How long does the information need to be used or accessed
Not applicable. Personal information will not be used as a result of Smart Cities.	

This section is left intentionally blank. Personal information will not be used as part of Phase I of Smart Cities.

4 Retention and Destruction Requirements

Using the City's Classification and Retention Schedule identify which classification, retention and disposition requirements apply to the information created.



Process Step	Identify which classification series applies.
Identify: <ul style="list-style-type: none"> Where the information will be saved; which information series applies How long the information will be kept beyond the end of year 	<ul style="list-style-type: none"> If the information will be destroyed, deleted OR if archives has identified it as information of interest Attach: <ul style="list-style-type: none"> Information series from the City's Classification and Retention Schedule
<p>Note: If a long term retention is required, describe the plan for ensuring continued access to the information</p>	
<p>Personal information will not be retained as a result of Smart Cities Phase I. Data sets which are created as a result of merging data sets which inadvertently contain personal information will be destroyed immediately.</p> <p>Data sets on Open Data will be retained and disposed of in accordance with the City's existing records schedule Cit-e File as listed below:</p>	



018 Information Analytics

Information related to the process of collecting and analyzing data to make decisions based on descriptive, diagnostic, predictive and prescriptive analytics. This includes data and open sciences, analytic culture, analytic and open data curriculum and data management.

Includes but not limited to:

- Aggregate data
- Best practices
- Metadata standards
- Research
- Tools
- Tutorials

Retention

Trigger: Current year

Period: 12 years

Based on:

Disposition: Destruction

Systems: Tableau
SAP BI
Viewpoint BI
Google and network drives

Core to: All departments

Excludes

- Training, refer to *2022 Human Resource Management - 190 Training*
- Projects, refer to *2034 Project Management - 020 Operating Projects*

Notes

- n/a

Part 4 - Disclosure of Personal Information

If this initiative **does not result in disclosure of** information Part 4 of this assessment can be omitted.

Disclosure: To make known or reveal personal information to a person who is not an employee of the City. Disclosure occurs when a City employee shares personal information with a person or entity other than someone working for the City . (i.e. disclosure to Government of Alberta)

In the FOIP Act Part 2, Division 2, Section 40 directs the purposes for which the City may disclose personal information.

Many sections of Part IV of this PIA are not relevant to Phase I of Smart Cities initiative. While assessing disclosure of personal information is within the scope of this PIA, the intent of Phase I of the Smart Cities initiative is not to disclose personal information. Data sets will be vetted twice: electronically and manually to ensure that personal information is not disclosed.

Future phases of Smart Cities will not entail the disclosure of personal information. As part of future phases, personal information will be used for analytics purposes to create data sets, but data sets containing personal information will not be disclosed to third parties. Prior to disclosure of personal information, this PIA Template will be updated and Part IV will be completed.



1 Authority for Disclosure

Identify the authority for the disclosure of personal information needed for the initiative. Section 40(1) states reasons that a public body (City of Edmonton) may disclose personal information. The two most commonly used at the City are

- (c) for the purpose for which the information was collected or compiled or for a use consistent with that purpose,
- (d) If the individual the information is about has identified the information and consented, in the prescribed manner, to the disclosure

Refer to section 40 of the FOIP Act if these authorities do not match the purpose for the disclosures in the initiative

Process Step	Identify the authority for the disclosure
Identify: <ul style="list-style-type: none">• Subsection b or c	<ul style="list-style-type: none">• If subsection d is the authority complete the above section on Consent for Disclosure.
Section: Authority for disclosure is not required because personal information will not be disclosed as a result of Phase I of Smart Cities.	

* Consent for Disclosure 40(1)(d)

If consent is the authority for use, complete this section.

Process Step	Develop consent process.
Identify: <ul style="list-style-type: none">• Why consent is needed• If consent is implied or expressed and rationale• If consent is oral, electronic or written and rationale• How consent will be obtained• Who will obtain consent	<ul style="list-style-type: none">• Additional training if required• How the consenting individual will be verified• How consent may be revoked by the individual Attach: <ul style="list-style-type: none">• Consent form/statement• Consent procedure• Training materials
Consent for disclosure is not relevant because personal information will not be disclosed as a result of Phase I of Smart Cities.	



2 Disclosure of Personal Information

Process Step	Determine which personal information must be disclosed in support of the initiative, who is conducting the disclosure, how the information is being disclosed and what the purpose for the disclosure is.
--------------	---

Completing Table C - Disclosure of Personal Information (Next Page)

Note: Not all personal information that is used as a result of an initiative will be disclosed. Copy and paste those elements that relevant from Table A.

Using the Flow of Information Map from Part 1:

Column 1 - Personal information disclosed:

- List each specific piece (element, type) of personal information separately
- Refer to the definitions section.
- Include any elements that can be used to identify an individual

Column 2 - Who will disclose the information:

- Identify the role that will disclose (i.e Program head)

Column 3 - Source of information to be disclosed:

- Identify whose personal information is being disclosed and the data source.

Column 4 - Purpose of the disclosure:

- Identify why each piece of information that will be disclosed (i.e Social Services needs to record if the registrant has already taken the same program; funding would not be provided a second time)
- Identify which subsections from section 40 reflect the purpose for the disclosure of the information [i.e. 40(l)]

Column 5 - Receiver:

- The entity that will receive the personal information
- The role that will receive the personal information

Table C - Disclosure of Personal Information

Personal Information disclosed	Who is disclosing it	Source of information	Purpose of Use	Receiver
I.e. Name	I.e Program Lead	I.e. Registrant Information sourced from CLASS	I.e Determine funding availability	I.e. Bursary Coordinator at the University of Alberta

Edmonton

This table has been left intentionally blank because personal information will not be disclosed as a result of Phase I of Smart Cities.

3 Disclosure for Research or Statistical Purposes - Purpose and Approvals

(This section can be omitted if there is no disclosure for research or statistical purpose)

The collection, use and disclosure of personal information for research purposes is addressed very specifically in the [FOIP Act](#); Section 42 outlines the requirements, one of which is the need for an agreement to be in place. Section 9 of the [FOIP Regulation](#) identifies the requirements needed in the researcher agreement.

Process Step	Contact Law Branch to develop agreement.
Describe: <ul style="list-style-type: none"> How the research cannot be accomplished without identifying the individuals How any link is not harmful to the individual and the benefits are in the public interest 	Include how the head of the City has approved conditions relating to: <ul style="list-style-type: none"> Security and confidentiality Removal of identifiers at the earliest reasonable time
<p>Agreements are not relevant for Phase I of Smart Cities. Future phases of Smart Cities will require the creation of research agreements with health care authorities, educational bodies, and community associations from whom the City will collect data. Prior to the collection, use, and disclosure of personal information collected from third parties, the City will enter into agreements as required.</p>	

4 Frequency and Duration of Disclosure

(This section must be completed by all initiatives that involve a disclosure)

Personal information should be disclosed only as often as necessary and only for the time period necessary to support the initiative. (i.e. Report is provided to the funders each time a new program begins.)

Process Step	Identify how often the information will be disclosed and the duration for which personal information will be disclosed.
--------------	---



Describe:

- How often this information will be disclosed and the duration for which personal information will be disclosed.

Not applicable

Part 5 - Custody, Control and Responsibilities

When a public body has either custody or control over personal information, FOIP establishes that the public body has certain responsibilities such as

- responding to requests for access to information,
- protecting information, and
- collecting, using, and disclosing personal information for the purposes allowed by FOIP.

The City may not always have custody and control over personal information that is the subject of an initiative.



1 Custody

Personal information is in the custody of the City if the City has physical possession of the personal information (i.e. information stored in hardcopy, on a City server, hard drive, or memory stick). When the City is working in partnership with another organization or contractor it necessary to establish and document who has custody over what personal information so that accountability under the Act is clearly understood.

Process Step	Determine who has custody of the personal information
Identify: <ul style="list-style-type: none">• If the City has custody of the personal information• If another organization, contractor or other entity has custody of the personal information	Attach: <ul style="list-style-type: none">• Documentation that identifies responsibility for custody such as legislation or policies• Partner or vendor agreements that specify custody arrangements
<p>Custody of personal information is not relevant for Phase I of Smart Cities. Personal information will not be collected, used, and disclosed as a result of Phase I.</p> <p>It is unknown if personal information collected in later phases of Smart Cities will be in the custody of the City. If a healthy city data repository is created, a cloud-based solution may be selected to store data.</p>	

2 Control

Personal information is under the control of the City, when the City is responsible for:

- restricting,
- regulating, or
- administering its use, disclosure, disposition, or preservation; or
- The information was generated as a result of the City fulfilling a City mandate

Process Step	Determine who has control of the personal information in the City's custody
Describe: <ul style="list-style-type: none">• Describe who has control of the records• How the controls will appear in the agreement	Attach: <ul style="list-style-type: none">• Documentation that identifies responsibility for control
Note: When an initiative involves multiple entities, control must be documented.	
Control of personal information is not relevant for Phase I of Smart Cities. Personal information will not be collected, used, and disclosed as a result of Phase I.	



Personal information collected in later phases of Smart Cities will be in the control of the City; it will be collected from health care authorities, educational bodies, and community organizations. Agreements will specify that information collected from these third parties will be in the control of the City.

3 Access to Information

An individual may make an access to information request to the City by contacting a departmental FOIP Coordinator or the OCC FOIP Office. If personal information is stored offsite or in the custody of another entity it is necessary to put in place measures to ensure that personal information is retrievable should it be requested.

Process Step	Determine how access to information will be supported if the City does not have custody of the information.
Describe: <ul style="list-style-type: none"> The access to information process 	Attach: <ul style="list-style-type: none"> If the City does not have custody of the information, documentation that identifies how access to information will be supported.
Note: In accordance with the City's FOIP Delegation Order, access to information requests about the Smart Cities will be processed by the City's Corporate Access and Privacy Team at the Office of the City Clerk. As data sets created as a result of Smart Cities Phase I will not contain personal information, a specialized procedure for providing individuals' with access to their own information will not be necessary to be developed.	

4 Right to Request a Correction

If an individual believes the personal information about themselves contains an error or an omission they have the right to request a correction.

Process Step	Determine how a Request for Correction to Personal Information will be supported if the City does not have custody of the information.
Completed by	PIA Lead, Departmental FOIP Coordinator, Vendor, Partner
Describe: <ul style="list-style-type: none"> How the information will be retrievable 	Attach:

Edmonton

	<ul style="list-style-type: none"> If the City does not have custody of the information, documentation that identifies how a request for information is supported.
<p>As data sets created as a result of Smart Cities Phase I will not contain personal information, a specialized procedure for providing individuals' with the ability to correct their own information will not be necessary to be developed.</p>	

5 Complaints

If an individual believes that personal information has been collected, used, or disclosed in contravention of the FOIP Act they have the right to make a complaint to the Office of the Information and Privacy Commissioner of Alberta (OIPC).

Process Step	Determine how a privacy complaint will be managed within the initiative if the City does not have custody of the information.
Describe: <ul style="list-style-type: none"> How accountability will managed for complaints 	Attach: <ul style="list-style-type: none"> If the City does not have custody of the information, documentation that identifies how privacy complaints are supported.
<p>Note: Formal complaints are received by the OCC FOIP, but when an initiative is provided in partnership it is necessary to ensure that accountability for managing complaints is assigned and understood by all parties.</p>	
<p>In accordance with the City's FOIP Delegation Order, complaints made pursuant to the FOIP Act are investigated and responded to by the Corporate Access and Privacy Office at the Office of the City Clerk.</p> <p>Privacy breaches are investigated in accordance with the City's Privacy Breach and Complaint guideline.</p> <p>In future phases of Smart Cities, agreements with partner organizations such as Health Authorities, educational bodies, and community organizations will identify privacy complaint reporting requirements and actions.</p>	

6 Privacy Breaches

If a privacy breach occurs City employees are to immediate action to control the breach and to notify OCC FOIP.



Process Step	Determine how a privacy breach will be managed within the initiative
Describe: <ul style="list-style-type: none"> How the steps that will be taken to stop the breach, investigate and put in place preventative measures 	Attach: <ul style="list-style-type: none"> If the City does not have custody of the information, documentation that identifies how privacy breaches will be managed.
Note: Process for information within the City's custody is to take immediate action to control the breach and then contact OCC FOIP. If another entity has custody of the information, measures will need to be taken to ensure that a response to a privacy breach is managed.	
<p>As Phase I of Smart will not entail collection, use, and disclosure of personal information, it is not anticipated that privacy breaches will occur during Phase I. However, should a privacy breach occur, it will be investigated and responded to by the Corporate Access and Privacy Office in accordance with the City's FOIP Delegation Order and the City's Privacy Breach and Complaint guideline.</p> <p>In future phases of Smart Cities, agreements with partner organizations such as health authorities, educational bodies, and community organizations will identify privacy breach reporting requirements and actions.</p>	

7 Corporate FOIP Training Plan

Process Step	Ensure corporate FOIP training has been completed.
Describe: <ul style="list-style-type: none"> What approach will be used to ensure staff have completed Corporate FOIP training prior to implementing the initiative. Training is available via the learning management system. 	
<p>All new employees are required to take introductory access and privacy training as a part of employee on-boarding.</p>	

8 Specialized FOIP Training

In order to ensure that employees are collecting, using, and disclosing personal information in accordance with the PIA specialized training may need to be provided. (i.e. CCTV Cameras for Pool Supervisors)

Process Step	Identify any training that may need to be provided that not within the scope of the corporate training.
Describe:	Identify:



<ul style="list-style-type: none"> • What approach will be used to ensure staff have completed all specialized FOIP training prior to implementing the initiative 	<ul style="list-style-type: none"> • Which roles will require specialized training <p>Attach:</p> <ul style="list-style-type: none"> • Training materials
<p>Customized training will be developed and delivered by the Corporate Access and Privacy Program for the Smart Cities team.</p>	

9 Physical Safeguards

Physical safeguards are physical controls used to protect personal information from unauthorized collection, access, modification, use, disclosure or destruction. (i.e. locked entries, keycard access, secure server rooms)

Process Step	Identify physical safeguards in place to protect information
<p>Describe:</p> <ul style="list-style-type: none"> • Physical safeguards put in place to protect the information 	
<p>Physical access to the City's network is controlled in accordance with role-based access. Only specified individuals have access to card-locked areas that store servers.</p>	

10 Technical Safeguards

Technical safeguards are technology based controls used to protect information from unauthorized collection, access, modification, use, disclosure or destruction. (i.e. passwords, electronic cleaning apps, firewalls)

Process Step	Identify technical safeguards in place to protect information
<p>Describe:</p> <ul style="list-style-type: none"> • Technical safeguards put in place to protect the information 	
<p>In Phase I of Smart Cities, a number of technical components that will be used to safeguard personal information:</p> <ul style="list-style-type: none"> • Role based access controls: Only Data Engineers (people responsible for the data and coding of the privacy rule filters) will have access. This will be accomplished using File Level Security (Windows Active Directory). • The Transformation software (Extract, Transform, Load - ETL) which will be used to house the privacy rules (code to be applied to the data) will be secured using LDAP (Lightweight Directory Access Protocol) to ensure access to the data and rules. 	



The rules will include:

- Roll up of data to the neighbourhood level.
- Detection of any Personal Information or identifiers including:
 - FN, LN
 - Address
 - Phone
 - Assessment Roll i.e., (tax roll #) (account #) (house #, legal description)
 - Postal Codes (if under first three digits)
 - Any numeric value under 25 (i.e., incidents)
- In the event that personal information is created as result of merging data sets, the personal information will be erased using a dual stage delete to ensure complete removal from any physical storage. In future phases of Smart Cities, the privacy filter will be programmed to detect personal health information.

As the intent of Smart Cities Phase I is not to collect, use, or disclose personal information, the technical safeguards required to protect personal information in Phase I of Smart Cities are not as rigorous as those that will be required for future phases.

11 Administrative Safeguards

Administrative safeguards are administrative controls used to protect information from unauthorized collection, access, modification, use, disclosure or destruction. (i.e. policies, procedures, agreements)

Process Step	Identify administrative safeguards in place to protect information.
Describe: <ul style="list-style-type: none">● Administrative safeguards put in place to protect the information	
<p>As the intent of Smart Cities Phase I is not to collect, use, or disclose personal information, Smart Cities will rely on existing administrative safeguards required to protect personal information including the following:</p> <ul style="list-style-type: none">● The City maintains directives and procedures regarding privacy and the protection of personal information● All City staff must take access and privacy training as part of employee onboarding● The Corporate Access and Privacy Office will develop customized training for the Smart Cities team● Data sets will be reviewed by the Privacy Working group prior to publication on Open Data	



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12 Audit Process

(This section can be omitted if there is no **significant**, **sensitive** or **ongoing** collection, use or disclosure)

When an initiative involves a significant or ongoing collection, use, or disclosure of personal information auditing is a necessary administrative control to ensure that personal information is only accessed, collected, used, disclosed, and destroyed by those authorized to perform those functions.

Process Step	Identify audit process
Identify: <ul style="list-style-type: none"> Who is responsible for the audit How auditing will be performed How often the audit will be performed 	<ul style="list-style-type: none"> Actions that will be taken if a discrepancy occurs Attach: <ul style="list-style-type: none"> Audit questions
<p>As the intent of Phase I of Smart Cities is not to collect, use, or disclose personal information and personal information will not be retained (if inadvertently created), an audit process has not been developed. However, future phases of Smart Cities will entail development of an audit process.</p>	

13 Accuracy Verification Process

When personal information is not accurate errors can occur that affect personal privacy.

Process Step	Identify how personal information will be kept accurate
Consider: <ul style="list-style-type: none"> Is there a record of the last date the information was updated Is information reviewed for accuracy after a particular amount of time What is the procedure for controlling who may make changes to data Who verifies that information is accurate How is information verified for accuracy 	<ul style="list-style-type: none"> Where are copies stored; do they need modification Who is responsible for maintaining the master-copy of the record Identify: <ul style="list-style-type: none"> Methods to ensure that personal information is accurate.
<p>As the intent of Phase I of Smart Cities is not to collect, use, or disclose personal information, a process to verify the accuracy of personal information is not necessary for Phase I.</p>	



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14 PIA Communication Plan

When an initiative involves a collection, use, and disclosure of **sensitive** information and/or **ongoing** collection, use, and disclosure it may be necessary to design a communications plan to support dissemination of the PIA. Stakeholders may require or expect to receive a copy of the PIA.

Process Step	Develop a PIA communications plan.
Describe: <ul style="list-style-type: none">• Why a communications may be needed• Describe the plan	Attach: <ul style="list-style-type: none">• PIA Communication Plan
<p>A communication plan for this PIA has not been developed. This PIA will be shared with the Office of the Information and Privacy Commissioner of Alberta for review and comment as required by the terms of Smart Cities submission. This PIA will also be made publicly available upon request.</p> <p>In future phases of Smart Cities, an extensive communications plan that explains privacy protections to the public to ensure public acceptance and support for Smart Cities. A communications plan must also address when, if, and the method of notification to individuals regarding the collection, use, and disclosure of their personal information is necessary.</p>	

15 Methods for Limiting Collection, Use and Disclosure

It is a principle of privacy to only collect, use and disclose the minimum amount of information that is needed to support the performance of the initiative.

Examples of methods used to limit collection, use and disclosure of information include:

- Defining collection fields on forms
- Excluding free text collection on forms
- Narrowing the frequency and duration
- Narrowing terms of consent
- Providing training about collection
- De-identifying information after collection
- Setting retention periods
- Limiting who may collect and access personal information

Process Step	Identify which methods will be utilized to limit the amount of personal information impacted
Describe: <ul style="list-style-type: none">• Each limiting method used throughout the initiative	Attach (as applicable): <ul style="list-style-type: none">• Forms and report templates• Specialized consent forms



<ul style="list-style-type: none"> • Methods for removing personal information • City's approved retention and classification information 	<ul style="list-style-type: none"> • Collection, use or disclosure training outlines • Initiative guidelines for collection and access to personal information
<p>The primary method of limiting collection, use, and disclosure of personal information is the use of data by Smart Cities in Phase I. Personal information will not be collected, and Smart Cities will use data which is already publicly available through the City's Open Data portal.</p> <p>A further method of limiting disclosure is through development and implementation of the Privacy Filter (automatic and electronic method of filtering personal information from data sets). A tertiary method</p> <p>Future methods to limit collection, use, and disclosure will be developed in future phases of Smart Cities such as defined role-based access, agreements, auditing and monitoring of access to data sets, segregation of data, and enhanced rules for the privacy filter.</p>	

Attachments/Links Checklist

Required for all initiatives

- ☐ Drawing of the technical infrastructure
- ☐ A flow chart of the flow of information and provide a textual description of the flow chart
- ☐ Information series from the City's Classification and Retention Schedule

Required only if the section applies

- ☐ Surveillance camera use facility video surveillance policy
- ☐ Surveillance camera use video surveillance log
- ☐ Disclosure for Research or Statistical Purposes clauses to be used in the agreement
- ☐ PIA Communication Plan
- ☐ Specialized Training materials
- ☐ Auditing materials

Custody and Control

- ☐ Documentation that identifies responsibility for custody such as partner or vendor agreements
- ☐ Documentation identifying how custodian of information will assist with access to information, requests for correction, privacy complaints, privacy breaches, and retention and disposition of information.



Part 6 - Summary and Approval

Summary

Consider each section of the PIA and discuss what has been learned and determined.

The risks associated with Phase I of Smart Cities are relatively low given that the intent is not to collect, use, and disclose personal information and that data used by Smart Cities will consist of existing data sets. Automated (privacy filter) and manual review (Privacy Group review) of data sets created as a result of Smart Cities will limit the probability of personal information being disclosed on Open Data.

Future phases of Smart Cities will require an extensive assessment as the privacy risks associated with future phases will increase significantly given that future phases will entail collection and use of personal information, creation of a data repository, and partnerships with third parties such as health authorities, educational bodies, and community organizations.

Review Date

As per the audit process developed for the initiative, when is the next scheduled review date to ensure any changes have been documented or addressed?

This PIA will be reviewed when Smart Cities begins development of Phase II.

Approved:

Linda Sahli

City Clerk and Delegated FOIP Head

Date:

January 30, 2019



Introduction: The City of Edmonton's Access and Privacy System

The City's Access and Privacy system is based upon the Ten Principles of Privacy, pursuant to the Canadian Standards Association Model Code. While the Code was written for private industry, the framework establishes the ethical principles for privacy. Meaning that, regardless of legislation, organizations have an ethical duty to meet the ten principles.

Adherence to ethical principles, in addition to a legislative duties under the *Freedom of Information and Protection of Privacy Act*, is the foundation of the Corporate Access and Privacy program's vision for access and privacy at the City. Access to information and protection of privacy are pillars of democracy, and the City complies with the FOIP Act not because of a legal requirement. The City supports access and privacy as a means of ensuring the continued preservation of openness, fairness, and transparency. Privacy is a responsibility shared by all City Employees, and every employee has a duty to respect the privacy of citizens and fellow employees, and to safeguard personal information.

Introduction: The City of Edmonton's Access and Privacy System

1.0 ACCOUNTABILITY

1.1 Access and Privacy Program Organizational Structure

1.2 Planning and Resource Allocation

1.3 Performance Measurement

1.4 Legislation

Municipal Government Act

The Freedom of Information and Privacy Act

1.5 Bylaws

City Administration Bylaw # 16620

1.6 Policies

Open City

Records Management for Elected Officials

City of Edmonton Archives

1.7 Governance Delegations

Freedom of Information and Protection of Privacy Act Delegation Order

City Administration Bylaw Delegation of Authority

1.8 Directives

Administrative Directive A1433 Privacy

Cyber Security Administrative Directive

Information Management A1461

Privacy Breach A1445

Video Surveillance in Public Areas Directive and Procedure A1435

Release of Personal Information to a Law Enforcement Agency

Information Technology and Investment Architecture A1457

1.9 Code of Conduct

1.10 Procedures

Procedure A1461

Procedure A1442A

1.11 Standards

Operations Security Standard

Web Allowed Use Standard

Access Control Standard

Cyber Security Incident Management Standard

1.12 Frequently Asked Questions

Access to Information

FOIP Statements

Privacy Breaches

1.13 Guidelines

Access to Information and Privacy Guideline

Cyber Security Contractual Requirements for Cloud Solutions

Secure Shredding of Corporate Transitory Records

Records and Information Disposition

1.14 Corporate Information Management Committee

2.0 IDENTIFYING PURPOSES

3.0 CONSENT

4.0 LIMITING COLLECTION, USE, AND DISCLOSURE

4.1 Governance

4.2 Advice

4.3 Contracting

4.4 Safeguards

4.5 Disclosures of Personal Information

4.6 Privacy Impact Assessments Process

5.0 LIMITING RETENTION

5.1 Governance

5.2 Organizational Structure

5.3 Records Schedule

5.4 Application of the Schedule

5.5 Destruction of Records

6.0 ACCURACY

7.0 SAFEGUARDS

7.1 Individual Accountability

7.2 Organizational Responsibility

7.3 Privacy Impact Assessments

7.4 Security Risk Assessments

8.0 OPENNESS

9.0 INDIVIDUAL ACCESS

9.1 Access to Information Processes

9.2 Right of Correction

10.0 CHALLENGING COMPLIANCE

Privacy Breach and Complaint Process

1.0 ACCOUNTABILITY

The principle of accountability requires that an organization is responsible for the personal information in its custody or control. Organizations must designate individuals to meet ethical and legislative duties, and policies and procedures must support implementation of the duties.

1.1 Access and Privacy Program Organizational Structure

In most municipalities in Canada, the Office of the City Clerk is responsible for duties under freedom of information and protection of privacy legislation. Responsibility for this important legislation recognizes the Clerk's historical role preserving the public record and making available the records of the municipality. At the City of Edmonton, the City Clerk is the "Head", pursuant to Alberta's Freedom of Information and Protection of Privacy Act, and the Director of Corporate Information Governance is the "FOIP Coordinator", pursuant to registry with the Office of the Information and Privacy Commissioner. The Clerk's Access and Privacy Unit, and Records and Information Management unit support the Clerk in meeting duties under the Act.

In the fall of 2018, the City centralized its FOIP services into the Clerk's Corporate Access and Privacy unit. The organizational structure of the unit reflects the hierarchical governance of the City's FOIP Delegation Order (positions cascade from the City Clerk to Junior Analysts on the basis of authority for decision-making). The Unit has also been divided into two separate streams in order to specialize and define roles and responsibility for access, and privacy. Including the City Clerk and the Director of the Section, fifteen employees comprise the Corporate Access and Privacy unit. This structure is key to ensuring appropriate access and privacy governance at the City.

1.2 Planning and Resource Allocation

Planning for the Access and Privacy Program occurs through a number of different City processes.

- Program goals are captured in the Office of the City Clerk's yearly business plan and linked to the Municipal Reference Model
- Program risks are captured in the City's Corporate Risk Registry.
- Financial review and program monitoring occur on an ad-hoc basis as required by the Director of the Section and through monthly variance reporting from the Corporate Finance unit.
- Technology Program needs are evaluated through a capital budgeting process.

Prior to centralization, the City's FOIP Delegation Order established that Deputy City Managers were responsible for ensuring that they appropriately resourced and staffed FOIP positions

within their Departments, and the City Clerk was responsible for resourcing the Corporate Access and Privacy Program. With centralization, the City Clerk is responsible for resourcing access and privacy at the City. Job descriptions and classifications are also being revised and standardized.

1.3 Performance Measurement

Performance measures demonstrate the efficacy and success of the City's Access and Privacy system.

Performance Measures related to access and privacy are tracked through the Corporate Access and Privacy Office.

The Corporate Access and Privacy Program reports weekly to the Director of Corporate Information:

- Current # of Open Access to Information files
- Current # of Open Files with the Office of the Information and Privacy Commissioner
- Current # of Open Routine Access Files
- Current # of Consult Files
- Year to Date # of Privacy Breaches
- Year to Date # of Online Access to Information Requests Received
- Year to Date # of Harassment and Discrimination Routine files released
- Year to Date # of Employees who Have Completed Online Access and Privacy Training

The City Clerk reports monthly to the Executive Leadership Team:

- Year to Date # of Access to Information Requests Received
- Year to Date # of Privacy Breaches

The City Clerk yearly reports monthly statistics in the Branch Business Plan:

- Yearly # of Access to Information Requests Received
- % of Access to Information Requests processed within 30 days
- Yearly # of Employees who Completed Online Access and Privacy training

1.4 Legislation

The following provincial legislation establishes the City of Edmonton's responsibilities regarding access to information and protection of privacy, and preservation of records.

Municipal Government Act

Section 1(i)(s) of the *Municipal Government Act* (MGA) establishes that a City meets the definition of a "municipality".

Section 208(1) of the *Municipal Government Act* establishes that minutes of council meetings must be recorded, and that all bylaws, minutes of council meetings, and other records and documents of municipalities are preserved.

The requirement to preserve records establishes the foundation for access to information and privacy.¹ Without effective records management, records cannot be trusted to be reliable or authentic.

The Freedom of Information and Privacy Act

Section 1(i)(i) establishes that a "local government body" meets the definition of municipality as defined in the MGA. Section 1(j)(ii) establishes that a "local public body" meets the definition of a "local government body". Section 1(p)(vii) establishes that a "local public body" meets the definition of a "public body". In accordance with Section 4(1), as a public body the City is responsible for duties and decisions with respect to records in its custody or control.

1.5 Bylaws

City Administration Bylaw # 16620

Pursuant to Section 85(1) of FOIP, Section 17 of the City Administration Bylaw (CAB) establishes that the City Manager is the FOIP Head for the City.

Section 15 of CAB establishes that the City Manager is responsible for records management at the City.

1.6 Policies

A "policy" within the City of Edmonton, is a document approved by Council that applies to the functioning of the whole City and also has a direct effect on citizens. In most cases, directives, procedures, and standards are the appropriate document to direct how the City will meet ethical and legislative requirements related to access and privacy. Few true "policies" exist that relate to access and privacy.

¹ Other legislation such as the federal Income Tax Act also identify requirements for retention of records. These requirements are met through the City's retention and disposition schedule.

Open City

Policy C581 establishes that City records are open by default, and private when required by legislation.

Records Management for Elected Officials

Policy C596 establishes duties for records management and access and privacy for elected officials.

City of Edmonton Archives

Policy 448 establishes the role of the City Archives in preserving records of enduring value of the City of Edmonton.

1.7 Governance Delegations

Pursuant to the City Administration Bylaw, the City Manager has delegated duties related to access and privacy.

Freedom of Information and Protection of Privacy Act Delegation Order

The City's FOIP Delegation Order establishes the duties and powers that the City Manager, as the FOIP Head, has delegated to roles and positions in the City.

The Order establishes that the City Clerk is the "Delegated Head" of FOIP for the City. The Delegated Head has authority to exercise all of the FOIP Head's powers, duties and functions under the Act and in accordance with City policy.

The FOIP Supervisor (the current Director of Corporate Information) has the authority to approve privacy impact assessments. The Director is also registered with the Office of the Information and Privacy Commissioner as the "FOIP Coordinator" for the City.

Other positions within the City Clerk's Office are delegated the authority to determine if collection, use, or disclosure of personal information is authorized, the extent to which collection, use, or disclosure is necessary, and if disclosure of personal information is an unauthorized disclosure of personal information. Positions outside of the City Clerk's Office do not have authority to make these determinations.

In accordance with the definition of Section 1(q) of FOIP, the Delegation Order applies to "a record of information in any form and includes notes, images, audiovisual recordings, x-rays, books, documents, maps, drawings, photographs, letters, vouchers and papers and any other

information that is written, photographed, recorded or stored in any manner, but does not include software or any mechanism that produces record”.

City Administration Bylaw Delegation of Authority

The City Manager has delegated approval of retention of City records, and disposition of City records, in accordance with approved retention schedules, to the City Clerk.

1.8 Directives

Administrative Directive A1433 Privacy

This Directive establishes that:

- The City will only collect, use, or disclose personal information with knowledge and consent and required or permitted by law
- That all employees are responsible for maintaining privacy and confidentiality in accordance with FOIP
- That the City will conduct privacy impact assessments

Cyber Security Administrative Directive

The Directive establishes the responsibilities for management of cyber security risks.²

Information Management A1461

This Directive establishes that the City will manage information securely, and as a strategic asset.

Privacy Breach A1445

This Directive establishes that the City will investigate privacy breaches.

Video Surveillance in Public Areas Directive and Procedure A1435

This Directive and procedure establishes the authority and standards regarding using video surveillance in public areas.

Release of Personal Information to a Law Enforcement Agency

This Directive establishes authority and standards regarding release of personal information to law enforcement.

² This Directive is in draft form, and has not yet been approved by the City Manager.

Information Technology and Investment Architecture A1457

This directive establishes responsibility for information and technology investment and architecture of all business systems, information, applications, technology and/or processes.

1.9 Code of Conduct

The City's Code of Conduct establishes and explains the rules and expected behaviors for employees in the City.

Principle 7 of the Code pertains to collection, use, and disclosure of personal information. The Code reiterates that employees have an obligation to protect personal information and not to collect, use, or disclose personal information for any purpose other than work duties.

Employees who do not follow the Code of Conduct are subject to discipline.

1.10 Procedures

Procedure A1461

Administrative Procedure A1461 establishes that employees must meet information management standards.

Procedure A1442A

Administrative Procedure A1442A establishes a procedure for use of non-standard hardware and software.

1.11 Standards

Operations Security Standard

Identifies the requirements regarding operations security including the need to maintain procedures, monitor logs, and protect against cyber security threats.

Web Allowed Use Standard

Establishes a standard to manage content carried out on City networks.

Access Control Standard

Establishes standards for managing access controls to information systems.

Cyber Security Incident Management Standard

Establishes standards for responding to cyber security incidents.

1.12 Frequently Asked Questions

Frequently Asked Questions related to access and privacy are available on the City's intranet site. These FAQ's are meant to answer common question related to access and privacy principles and processes at the City.

Access to Information

This FAQ provides an overview of the access to information process.

FOIP Statements

This FAQ explains the purpose and process for developing FOIP statements.

Privacy Breaches

This FAQ provides an overview of the privacy breach process.

1.13 Guidelines³

Access to Information and Privacy Guideline

The Corporate Access and Privacy Office maintains an internal guideline regarding unit processes. This is a dynamic document that is frequently amended to reflect process improvements, organizational change, and the results of reviews, investigations, and orders by the Office of the Information and Privacy Commissioner.⁴

Cyber Security Contractual Requirements for Cloud Solutions

This guideline establishes information security contractual requirements for Cloud Solutions.

Secure Shredding of Corporate Transitory Records

Establishes the guidelines for secure destruction of transitory records.

Records and Information Disposition

Establishes the guidelines for application of retention and disposition to City records.

³ This section includes a selection of guidelines related to management of information, and does not reflect all of the guidelines available at the City.

⁴ Some sections of the guideline are being revised as they reflect the previous decentralized structure of FOIP services at the City.

1.14 Corporate Information Management Committee

The Corporate Information Management Committee is a group of individuals representing information management units within the City including:

- The City Clerk and FOIP Head
- Director of Corporate Information Governance (Director of Corporate Access and Privacy unit)
- Chief Information Security Officer
- The City Archivist
- Principal Information Manager
- Manager of Corporate Access and Privacy
- The Manager of Data Governance

The purpose of this committee is to ensure that information is managed effectively across the City, and that the City Clerk has information to support decision-making with respect to access to information, privacy, and records and information management.

2.0 IDENTIFYING PURPOSES

This principle establishes that an organization must inform individuals about the purpose for which personal information is being collected, and how it may be used and disclosed.

The City meets the requirement to inform individuals through the following means:

- Administrative Directive A1433 Privacy commits that the City will inform individuals of the collection, use, and disclosure of their personal information.
- Authority to develop notification of collection, use, and disclosure is delegated in the City's FOIP Delegation of Authority. The Corporate Access and Privacy Office works with business areas to develop notification statements, pursuant to Section 34(2) of FOIP, and approves FOIP statements.
- Guidance for creating FOIP Statements is available on the City's intranet site.
- The Privacy Impact Assessments process requires that business areas develop and demonstrate how individuals will be notified of collection, use, and disclosure.
- The Privacy Impact Assessment process requires that personal information is collected directly from the person who is the subject of the information unless as permitted by Law. Direct collection creates a platform for notification.
- Notification of collection, use, and disclosure appears on City forms, the City webpages, and any communications sent out by the City when personal information is collection.

3.0 CONSENT

This principle establishes that organizations must collect, use, and disclose personal information with informed consent.

The City meets this principle through the following means:

- Administrative Directive A1433 Privacy commits that the City will collect, use, and disclose personal information with consent or as allowed by law.
- The City's FOIP Delegation Order establishes that business areas must ensure that consent for use and disclosure meets the terms of the FOIP Regulation.
- The Privacy Impact Assessment process supports the commitment of Administrative Directive Privacy A1433 by ensuring that initiatives (programs, services, surveys) are developed to support the right of consent.
- The Corporate Access and Privacy staff provides advice and creates forms to support consent processes.

4.0 LIMITING COLLECTION, USE, AND DISCLOSURE

This principle establishes that organizations should only collect, use, or disclose personal information when necessary and only to the extent necessary.

The City achieves this principle through the following means:

4.1 Governance

The City's FOIP Delegation Order establishes authority for determining the necessity and need to collect personal information. The Order identifies that positions within the Corporate Access and Privacy unit determine whether or not a proposed collection is authorized under the FOIP Act; these positions also have the authority to determine the extent and necessity of disclosures of personal information. No other positions within the City have this authority.

4.2 Advice

Positions within the Corporate Access and Privacy Office regularly provide advice regarding the need to collect, use, or disclose personal information.

4.3 Contracting

The City's FOIP Delegation Order establishes roles related to information sharing. Pursuant to the Order, Corporate Access and Privacy staff are responsible for advising on content of agreements, and approving forms and templates related to forms, but Legal Advisors are responsible for drafting agreements. This process ensures that third parties only receive the personal information the third party requires to perform its contracted service.

All City agreements contain standard clauses related to access to information and privacy. These clauses identify requirements related to production of information in the event of a FOIP request, and the requirement to keep personal information secure and private.

4.4 Safeguards

The City employs administrative safeguards (such as policies, procedures, and training), technical safeguards (such as audit log monitoring, role-based access, network security), and physical safeguards (keycards and locks) to limit collection, use, and disclosure of personal information.⁵

⁵ Due to the scope and scale of City systems, full examples of how safeguards are employed are not provided in this document. Additional information is available upon request.

4.5 Disclosures of Personal Information

In order to limit disclosure of personal information, disclosures of personal information under Section 40 of the FOIP Act are processed and received by the Corporate Access and Privacy Office.

Forms such as the Disclosure to Law Enforcement form are used to document and track disclosures. This form standardizes the process of disclosures of personal information pursuant to 40(1)(q) of FOIP. This form must be completed when law enforcement agencies request personal information. Requests are processed by the Corporate Access and Privacy Office, and may be rejected if the law enforcement agency does not appropriately identify the extent or necessity of disclosure.

Other requests from bodies with authority to compel information such as the Workers' Compensation Board are also processed by the Corporate Access and Privacy Office. Requests are assigned a file number, and a third party is required to provide proof of legislative authority to compel production of information if the third party is seeking to compel production. Otherwise Corporate Access and Privacy staff determine if other disclosures under Section 40 are applicable.

4.6 Privacy Impact Assessments Process

The most effective means of limiting collection, use, and disclosure is designing initiatives (programs, services, surveys) with the principles of privacy as the foundation of design.

The Privacy Impact Assessment is the means by which the City ensures initiatives are designed to limit collection, use, and disclosure.

Performing PIAs is also a commitment stated in Administrative Directive A1433 Privacy . Privacy impact assessments are an important compliance tool and risk mitigation strategy.

Notification of Proposal Process

When a new or amended initiative (program, service, survey) involves the potential or confirmed collection, use, or disclosure of personal information, the proposed initiative is assessed to determine whether or not a full privacy impact assessment is required. Initiatives are assessed by the City's PIA Analyst.

Three streams notify the PIA Analyst of proposals.

- Business areas complete and submit the PIA Determination Form. This form is available on the City's intranet site. Completed forms are automatically sent to the PIA Analyst's gmail account.
- IT Project Managers submit the Project Notifier Form to the PIA Analyst's gmail account when a new project is being proposed. This process ensures that any technology

projects that have the potential to involve the collection, use, and disclosure of personal information consider privacy in the early stages of development.

- Business areas contact the PIA Analyst to discuss a proposal. This may occur through a phone call or email.

Determination Process

Once the PIA Analyst has been notified of a proposal, the Analyst meets with the business area to discuss the proposal. Meeting with the business area is critical as it is an opportunity to clarify the privacy risks, and, in some cases, demonstrate to business areas that the initiative can be developed without personal information. At the conclusion of the meeting, the PIA Analyst will determine whether or not a PIA is warranted based on an assessment of risk, and the decision is documented in the PIA determination form. In some cases, proposals do not require a full PIA, but simple privacy risk controls such as creation of a FOIP statement or development of a form.

PIA Process

If a PIA is required, the Analyst will work with the business area to perform a PIA. The emphasis of the PIA is not completion of the PIA Template, but understanding, identifying and mitigating privacy risks associated with the initiative as it is being developed; the PIA Template is the tool used to document the PIA process. In order to properly identify and control risks, a multi-disciplinary PIA Team is created consisting of the business area, the privacy analyst, a records manager, and an IT security analyst. Other specialists, such as a communications advisor, will be brought into the process as required. When a PIA is complete, it is approved, in accordance with the FOIP Delegation Order, by the Director of the Corporate and Access and Privacy unit.

Review and Monitoring

The PIA Template identifies a date or trigger for review of a PIA. Setting a review ensures that privacy risks and controls will be monitored over time, and that if collection, use, or disclosure of personal information changes, either a new PIA is completed or the business area completes the PIA Amendment Form.

Information about the PIA process are available on the City's intranet site.⁶

⁶ Information about the PIA process is being revised as it reflects the previous "decentralized" structure of access and privacy at the City.

5.0 LIMITING RETENTION

This principle establishes that organizations should retain personal information only as long as the information is required, and that personal information should be securely destroyed when the business and/or legal purpose to retain the information has been met.

5.1 Governance

The City Administration Bylaw establishes that the City Manager is responsible for disposition of records and preserving records of the City.

In accordance with the City Administration Bylaw Delegation, the City Clerk has been delegated responsibility for disposition of City Information, and approval of records retention and disposition schedules.

5.2 Organizational Structure

The Office of the City Clerk includes a Corporate Records and Information Branch unit (CRIM). The Unit is managed by the Principal Information Manager for the City. Corporate Business Leads, and corporate warehouse staff perform duties related to storage, retrieval, classification, and retention and disposition.

5.3 Records Schedule

CRIM has developed and maintains a records schedule for City Information (Cit-e File). The schedule is comprehensive, dynamic, and applies to all City information regardless of format and in accordance with the definition of "record" in FOIP. The application of the schedule to City information ensures that personal information is destroyed when it is no longer necessary.

The location of personal information in City storage systems is mapped in Cit-e File, and access is noted as restricted as appropriate.

The retention periods and disposition for records are defined through legislation and consultation with business areas, and Legal Advisors review proposed periods and disposition. Changes to the schedule are managed through a formal change request process, and reviewed by the CRIM Unit.

5.4 Application of the Schedule

Application of retention and disposition requirements are identified for all new systems through the privacy impact assessment process.

The CRIM unit has designed a strategy for application of the schedule to all existing information systems.

Records delegates within Departments support the implementation of the schedule through inventorying, review of records, and transfer to the Corporate Records Centre.

5.5 Destruction of Records

Records are securely destroyed either by the City's contracted shredding vendor or by the City's Information Technology Branch.⁷

⁷ A selection of documents have been included for reference that relate to retention and disposition, but the reference material is not comprehensive to the full Records and Information Management Program. Additional information is available upon request, including Cit-e File (City records schedule).

6.0 ACCURACY

This principle establishes that in order to lessen the risk of using incorrect information about an individual to make a decision about that individual, organizations should maintain accurate, complete, and up-to-date information.

The City best meets this principle through the privacy impact assessment process. The PIA process requires business areas to establish and demonstrate how personal information collected, used, and disclosed will be kept accurate.

- Governance
System governance must be documented to ensure that roles and responsibilities with respect to collection, use, and disclosure of data is clear.
- Direct collection
The type of controls implemented to ensure accuracy depends upon the initiative, but the primary method to ensure accuracy of personal information is direct collection from the individual who is the subject of the information. Direct collection lessens the risk of inaccurate data because the data is not filtered through a third party or system which may risk compromising the data.
- Standards, Procedures, and Training
Policies, procedures, and training related to collection of data ensures that those collecting information or systems designed to collect personal information follow standards protocols. Standardization of collection lessens the risk of inaccurate data.⁸
- Access Controls
Limiting access to personal information limits the opportunity for modification or deletion. Role-based access is the City standard for access controls, pursuant to the City's Access Control Standard.
- Monitoring
Monitoring of access to system allows the opportunity to identify if data has been modified, and take necessary action to amend the data or amend security controls.

⁸ The City is developing a corporate metadata standard in order to improve data quality.

7.0 SAFEGUARDS

This principle establishes that organizations must maintain safeguards to protect personal information, and employees must be aware of the requirement to protect personal information.

Administrative Directive A1433 commits the City to privacy, and meet the FOIP Act's "duty to protect".

The City maintains administrative, technical, and physical safeguards to protect personal information. All of the components of the City's Access and Privacy System safeguards contribute to safeguarding personal information.⁹

7.1 Individual Accountability

Protecting personal information is a responsibility owned by every employee at the City, and the City's Code of Conduct sets out the City's expectations with respect to protecting of privacy.

Training is also provided to employees to ensure that employees understand expectations. For example:

- Online access and privacy training dealing with basic topics is a required piece of employee on-boarding.
- In recognition that employees require specialized training to address job-specific privacy issues, the Corporate Access and Privacy Office develops and delivers customized training sessions for business areas. Training is often a required mitigation following the occurrence of a privacy breach or a complaint.
- Code of Conduct is a required piece of employee on-boarding.
- Corporate Records and Information Management training is offered in person and through the City's Learning Management System.
- The Information Security Unit offers in-person training, and maintains a variety of tools to educate staff on security.
- The Google Support team offers a suite of training with respect to use of Google.

7.2 Organizational Responsibility

Business areas within the City are responsible for privacy as follows:

- The Corporate Access and Privacy program is responsible for meeting duties under the FOIP Act, and maintaining procedures, guidelines, and processes to protect privacy. The FOIP Delegation Order sets out authority for making decisions regarding collection, use, and disclosure of personal information and identifies that the City Clerk is the Delegated Head of FOIP For the City.

⁹ Given the scope and scale of the City's many programs, services, and information systems a full documentation of all of the City's safeguards, it is impossible

- The City's Open City and Technology Branch is responsible for design, implementation, and monitoring of technical safeguards such as information system monitoring, firewalls, and network maintenance. The Information Security unit sets directives, standards, and procedures with respect to information security.
- The Corporate Security unit within Law Branch is responsible for design and implementation of safeguards to protect personal information such as key access, locks, and camera placement.

7.3 Privacy Impact Assessments

The Privacy Impact Assessment process requires that business areas identify administrative, technical, and physical safeguards to protect information. The type of safeguard required depends upon the initiative and the severity of privacy risks.

7.4 Security Risk Assessments

The Information Security unit performs information security assessments on new or amended information systems. The Information Security Unit also maintains a strategy to assess existing systems.

8.0 OPENNESS

This principle establishes that organizations should be open about its policies, procedures, and practices with respect to privacy.

As an Open City, transparency and openness is a key component of the City's access and privacy system. The City meets the principle of openness in the following ways:

- The City makes available its directives related to access and privacy on its website: website.
- The City makes available information about its Access and Privacy program on its website. A Frequently Asked Questions page provides answers to common questions related to access and privacy.
- The City provides information about its collection, use, and disclosure of personal information via its website
- A data set listing closed formal access to information files is available on Open Data. Individuals who wish to access closed files can make a request for the Corporate Access and Privacy Office and these files will be made available free of charge.

9.0 INDIVIDUAL ACCESS

This principle establishes that organizations must inform individuals of the right and the process to request access to their own information, and the right and process of correction of personal information.

9.1 Access to Information Processes

The City makes organizational informational and personal information available via routine, proactive, and formal means.

Proactive Release

City information deemed to be in the public information is made available via the City's Open Data portal and the City's website.

Routine Release

The City routinely releases City information through multiple means. Permit and application information can be requested through Urban Form and Corporate Strategic Development's online process, and business areas frequently release information to the media or citizens through informal channels such as phone calls or email.

Formal Access to Information Requests

Pursuant to the City's FOIP Delegation Order, positions within the Corporate Access and Privacy Office are responsible for responding to formal access to information requests, and applying exceptions to disclosure. Individuals may make access to information requests electronically via the City's website. Requests are received in a central system mail-box accessible only available by the Corporate Access and Privacy Office. Prior to initiating a formal request, staff assigned to the request will work with the applicant to determine if the request can be fulfilled via routine or proactive sources. The FOIP Delegation Order outlines decision-making authority for processing formal FOIP requests.¹⁰

9.2 Right of Correction

The City's FOIP Delegation Order establishes that the positions within the Corporate Access and Privacy Office process requests for correction.

Individuals are notified of their right to request a correction on the City's FOIP Page.

¹⁰ Additional documentation about processing formal access to information requests is available upon request.

Once received by the Corporate Access and Privacy Office, an Analyst will assess the request and determine if it is a formal request. If the request needs to be treated as a formal request, a form will be sent to the requestor to document the request. An Analyst will process the request, and business areas are responsible for applying the correction. The FOIP Delegation Order establishes that business areas are responsible for noting corrections in records.

If the request relates to changing address information, the individual may contact the City's 311 Service.

10.0 CHALLENGING COMPLIANCE

An individual should be able to challenge an organization to demonstrate compliance with the principles of privacy, and an organization should designate individuals to investigate challenges, inquiries, and complaints.

The City makes a commitment to investigate privacy breaches and complaints in Administrative Directive Privacy Breach A1445. In accordance with the City's FOIP Delegation Order, privacy breaches and complaints are investigated by the Corporate Access and Privacy unit.

Individuals are notified of their right to challenge compliance through a number of means:

- The City makes available guidance regarding the right to challenge compliance on the City's website.
- Notification of the right to contact the OIPC is standard when notifying individuals of a breach or decision made under the Act.

Responsibility for responding to privacy complaints is delegated to the Corporate Access and Privacy Office via the City's FOIP Delegation Order.

Responding to access and privacy reviews by the Office of the Information and Privacy Commissioner is delegated to the Corporate Access and Privacy Office via the City's FOIP Delegation Order.

Responding to OIPC Inquiries is delegated to the City's Law Branch, with consultation and assistance provided by the Corporate Access and Privacy Office via the City's FOIP Delegation Order.

Privacy Breach and Complaint Process

Reporting

Employees can report privacy breaches and complaints electronically via the City's intranet site. Completed reports are sent to a privacy breach gmail account, and are accessible only by four staff in the Corporate Access and Privacy unit (Director, Manager, Access Supervisor, and Privacy Advisor).

Receipt of Notice of Complaint from the Office of the Information and Privacy Commissioner are received by the City's FOIP Coordinator (the Director of the Access and Privacy Unit).

An individual may report a breach or complaint by completing the Privacy Breach Complaint form available on the City's website and submitting it to the Corporate Access and Privacy Office.¹¹

Containment

Depending on the nature of the incident containment may involve immediate return, destruction or removal of access to personal information. Containment is performed at the direction of the Privacy Advisor, the Corporate Access and Privacy Manager, or the Director of the Access and Privacy unit.

Notifications

Internal and external notifications of a breach or a complaint are completed by the Privacy Advisor, the Corporate Access and Privacy Manager, the Director of the Access and Privacy unit, or the City Clerk. Individuals are always notified when a breach has occurred, and the OIPC is notified of high risk or sensitive breaches.

Investigation

Depending on the severity of the matter, the complaint or breach may be investigated by the Privacy Advisor, the Corporate Access and Privacy Manager, or the Director of the unit.

Investigation typically involves interviews with employees involved in the incident, review of electronic logs, review of documentation such as emails or procedures.

Interviews with employees who are involved in a breach or complaint are interviewed by the Advisor, Manager, or Director. Human Resources Labor Relations attend meetings involving union employees, and union employees are offered the opportunity to bring union representation to meetings.

Analysis and Documentation

A summary of findings of the incident is completed by the Privacy Advisor. The findings identify whether or not a breach occurred, the cause of the incident, the results of the incident, and measures to mitigate or prevent a future incident.

Discipline may be issued as a result of the summary of findings. The non-compliance with the City's Code of Conduct serves as the basis of discipline.

Monitoring and Review

A de-identified summary of findings of the incident is shared with the executive responsible for the business area where the breach or complaint occurred. The executive ensures that

¹¹ The Corporate Access and Privacy Office is in the process of designing an online form for reporting of privacy breaches and complaints.

mitigations are complete within assigned timelines. The Privacy Advisor will work with the business area to monitor and assist as necessary on measures such as policy and procedure development or privacy training.

Summaries of findings are provided to the OIPC during review, and complainants will be notified of determinations of investigations.

Approach to Privacy

The quality, reliability and integrity of information are critical to effective decision making at the City of Edmonton. As an Open City, Edmonton is working to build new ways to share information with residents, find new opportunities for dialogue and make programs and services easier to access. The City is committed to ensuring compliance with privacy and security standards for obtaining and using data as well as having mitigating controls in place to minimize risk.

To accommodate the phased development of the Healthy City program and individual projects, privacy and security is being approached through an ongoing, cyclical process. When new projects are identified or a change in direction of an existing project or initiative is deemed necessary, the project will be evaluated for privacy and security implications prior to any action being taken. Ongoing reviews of existing projects and initiatives will ensure the Healthy City program is continuously meeting the privacy and security needs of residents and partners in the Healthy City Ecosystem.

Privacy and security will be considered throughout the lifecycle of all projects and any new ideas, data or changes in approach will be analyzed through a standard privacy and security assessment. Through all phases of the Healthy City program, the implementation team will work directly with the City of Edmonton's Corporate Information Security Officer and Information Security Office to maintain the privacy and security of all information shared through the Healthy City Ecosystem. Similar to the Finalist phase of the Smart City Challenge, any subsequent Privacy Impact Assessments (PIAs) will be submitted to the Office of the Information and Privacy Commissioner (OIPC) of Alberta through the Office of the City Clerk (OCC) at the City of Edmonton.

The Healthy City program team will work collaboratively with staff from the OCC to assess compliance, identify any gaps and define privacy risk mitigations prior to the submission of PIAs. This approach includes consulting early with the Corporate Access and Privacy Office within OCC to ensure there is sufficient and reasonable lead time to develop any subsequent PIAs and to work through and mitigate any potential privacy risks.

The Healthy City program team will also take the additional steps of creating a Data and Privacy Advisory Group for the entire lifecycle of the Program and undertake a comprehensive ethical assessment framework. The ethical assessment will focus on assessing ethical considerations that go beyond current legislation.

Additional Supporting Information

a. What do the future phases of the program involve? The future phases (3) of Smart City will likely involve identifiable information (personal and/or health), so this PIA submitted to OIPC via OCC in March 2019 seeks to take a proactive approach, to lay the foundation for future PIAs.

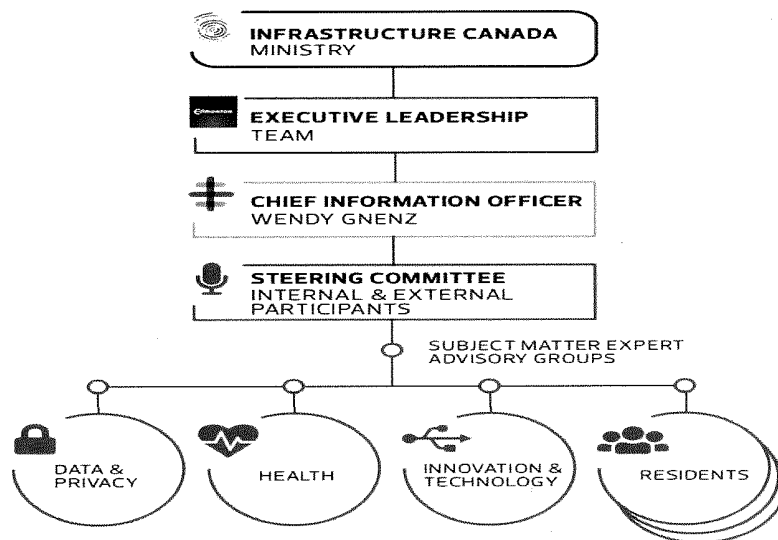
- Acceptance of program PIA for Phase I of the Challenge by OIPC is the prerequisite to the entire Smart City Program being initiated.

b. Will privacy considerations be taken into account in the achievement of Healthy City outcomes? If the City was selected as a winner, Smart City Challenge payments made by INFC Canada to the City of Edmonton will be tied to achieving outcomes. Outcomes include performance indicators, including:

- # of PIAs accepted from OIPC
- # of privacy training sessions hosted
- # of participants trained in privacy and security
- % increase in citizen trust and participation

c. How does the internal approval process for projects work? The program governance of Healthy City ensures the PIAs get approved and that no work (no project, no deliverable, etc) proceeds without this approval.

FIGURE 16: Healthy City Program Governance



- Executive Leadership Team (ELT includes City Manager and Deputy City Managers)
- Chief Information Officer (CIO)
- Healthy City Program Director & Project Management Office
- Subject Matter Expertise includes core groups focused on Project Management, Data and Privacy, Technology, Health and Residents/Engagement.
 - Before a project becomes a project for Smart Cities it must first be approved as a business case.
 - Project ideas/concepts can be initiated from any of the core groups. Within the Healthy City Projects team there is an operational function which assesses the business case/value for each project, examining the financials, privacy and security and citizen uptake.
 - Each project will have a common PM approach that monitors for performance, privacy and security and achievement toward outcomes.
 - The City is currently hiring a Data and Analytics Ethics Advisor who reports into the Chief Information Security Officer. In place Q2 2019.
 - TRAINING - upon program initiation with INFC Canada, prior to accessing systems, all Healthy City team members must have undertaken privacy training.
 - This is documented and must be demonstrated prior to allowing role-based access to Open City Technology Team
 - Ongoing training, including annual training (refresher)
 - New technology or legislation – updated training.

d. How many projects within the five-year program are envisioned? The Healthy City Program will implement 10 projects over the 5-year timeframe and each project is envisioned to have a specific PIA:

- 3 small scale projects (12-15 months duration)
- 2 medium scale projects (18-20 months duration)
- 5 large scale projects (24-30 months duration)

e. Briefly summarize the three program phases of Healthy City and links to privacy considerations:

Phase I - Initiate (Timeframe: first 18 months of Program or 0 to 1.5 years)

- Develop Roadmap and Strategy for the entire Phase. Timeframe: q1/y1
- Establish Governance structure. Timeframe: q1/y1
- Develop Program PIA for Phase I. Submit with OCC to OIPC. Timeframe: q2/y1
- Develop Project-specific PIAs for Phase I and submit with OCC to OIPC. Timeframe: continuous through phase I
 - The first project is ConnectED - phase I (large project). Timeframe: q2/y2

Phase II - Innovate (Timeframe: subsequent 24 months or 1.5 to 3.5 years)

- Develop Roadmap and Strategy for the entire Phase. Timeframe: q3/y2
- Confirm Governance structure. Timeframe: q3/y2
- Develop Program PIA for Phase II. Submit with OCC to OIPC. Timeframe: q4/y2
- Develop Project-specific PIAs for Phase II and submit with OCC to OIPC. Timeframe: continuous through Phase II
 - The second project is ConnectED - phase II (medium sized project). Timeframe: q3/y3

Phase III - Embrace (Timeframe: subsequent 18 months or 3.5 to 5 years)

- Develop Roadmap and Strategy for the entire Phase. Timeframe: q3/y3
- Confirm Governance structure. Timeframe: q3/y3
- Develop Program PIA for Phase III. Submit with OCC to OIPC. Timeframe: q4/y3
- Develop Project-specific PIAs for Phase III and submit with OCC to OIPC. Timeframe: continuous through Phase III.
 - The third project is ConnectED - phase III (small sized project). Timeframe: q3/y5

Data Privacy and Security Risks and Mitigating Actions

Potential risks for data privacy and security include the inability to keep up with changing regulations and resident expectations, as well as insufficient training for employees and partners. The City of Edmonton has assessed these and other program risks related to data management, privacy and security and has developed a series of mitigating actions to reduce their impact and likelihood.

Data Privacy and Security Risks and Mitigating Actions

Security or privacy breach results in loss of trust in program	2	5	10	Medium	Process and standards are in place to ensure data and information privacy and security. All members of the Healthy City Ecosystem and anyone working on the implementation of the Healthy City program (including employees and contractors) will be educated on the processes and standards including collection, use and disclosure of information. Develop and maintain an incident management plan.
Changing regulations on data privacy results in additional resources required to manage changes	2	4	8	Medium	Ongoing engagement with the Office of the Information and Privacy Commissioner of Alberta to ensure future iterations of data and privacy practices are in line with standards and requirements. Resources will be allocated to ensure changes are managed appropriately.
Regulations governing data privacy are modified or changed resulting in insufficient processes	2	4	8	Medium	Ongoing engagement with the Office of the Information and Privacy Commissioner of Alberta to ensure future iterations of data and privacy practices are in line with standards and requirements. Resources will be allocated to ensure processes are updated accordingly.
Lack of proactive communication with residents results in them raising concerns over data privacy and security	2	4	8	Medium	Privacy and security processes and standards are clearly communicated with residents. Residents are encouraged to share their feedback and concerns regarding data privacy and security.
Security or privacy breach at a partner organization results in loss of trust in program	1	4	4	Low	All members of the Healthy City Ecosystem and anyone working on the implementation of the Healthy City program (including employees and contractors) will be trained on the processes and standards including collection, use and disclosure of information. Develop and maintain an incident management plan.

Item	Question	Response	Instruction
1	My business area is the primary source of the data that is being requested (decision making authority for this data)		Proceed to next question
	1. The data is created and maintained in my business area on behalf of the corporation, and		
	2. The data is not from another organization or other business unit(s)		
2	Is the data being requested currently captured?		Proceed to next question
3	Are there any significant reasons why this data set should not be published?		Proceed to next question
4	Is this information (or a variation of this) currently being sold to the public/businesses?		Proceed to next question
5	Does this dataset contain :		
	Business information of a third party? <i>Trade secrets, financial, scientific or technical details and/or</i>		
5.1	<i>That was supplied in confidence and disclosure of which may cause harm to the third party</i>		Proceed to next question
	Personal information? <i>Personally-identifying information: (i.e. name, address, birthdate, ethnic origin, credit card</i>		
5.2	<i>information)</i>		Proceed to next question
	Information harmful to public safety? <i>May threaten any person's safety, mental or physical health</i>		
5.3			Proceed to next question
	Confidential evaluations? <i>Compiled to determine suitability for employment (i.e. references)</i>		
5.4			Proceed to next question
	Information harmful to security and/or law enforcement? <i>May harm the effectiveness of investigative techniques or may threaten the security of any property</i>		
5.5	<i>or system</i>		Proceed to next question
	Information that may be harmful to intergovernmental relations? <i>That was supplied in confidence by another public body</i>		
5.6			Proceed to next question
	Draft reports, resolutions, bylaws or other legal instruments?		Proceed to next question
	Advice, proposals, recommendations or policy options? <i>Positions, plans or criteria developed for contractual negotiations or for the management of</i>		
5.8	<i>personnel that have not yet been implemented</i>		Proceed to next question
	Financial, commercial or technical information in which the City has a proprietary interest? <i>Information which may result in financial loss, decrease of competitive position or interfere with</i>		
5.9	<i>contractual negotiations</i>		Proceed to next question
	Auditing procedures or standardized tests that if disclosed, future audits or test results may be		
5.1	<i>compromised?</i>		Proceed to next question
5.11	Information subject to legal privilege?		Proceed to next question
	Information harmful to the conservation of historic resources? <i>Information that may result in harm to heritage buildings, endangered species or burial grounds</i>		
5.12			Proceed to next question
5.13	Information potentially harmful to the reputation of the City organization?		Proceed to next question
6	Assign a security classification based on your understanding of the definitions. <u>Information Security Classification Standards</u>		This will be forwarded to a Solicitor for confirmation.
7	Has a Communications Advisor supporting your area assessed this data set for collaboration on the communications plan for the release of this dataset and related elements such as the timing, approach/promotions, messages and issue management?		Thank you

**Privacy Impact Evaluation
Corporate Services – Information Technology Branch
Open Data Catalogue Implementation**

I. BACKGROUND

The purpose of this project is to implement an Internet accessible data catalogue that will allow City's departments to provide open data to city residents and local application developers.

Include the following information:

1. The history or chronological development of the project :

- Councillor Don Iveson submitted a administrative inquiry on administration's activities related to open data during the Council meeting on October 14, 2009.
- The City of Edmonton's IT Branch held a "City Open Data Workshop" on November 21, 2009. The purpose of this workshop was to bring together residents to identify principles, opportunities and issues for City of Edmonton open data. The workshop included discussions on the priority of different data sets as well as high level design requirements for the data catalogue.
- The project team identified data sets that were already available on the City's website (www.edmonton.ca) in an inaccessible format, such as PDF.
- The project team selected Microsoft's OGDl platform to host the service. The OGDl platform was selected due to its minimal cost and rapid implementation.
- The data catalogue will be presented to Executive Committee on January 13, 2010 as part of the response to the councillor inquiry.

2. The status of the project.

- The City's Open Data site (data.edmonton.ca) is currently in internal testing. It will be transitioned to production status on January 13, 2010 after the presentation of the councillor inquiry response.

3. Why the project was undertaken. What the project does/will do

- The City of Edmonton is committed to openness and transparency. Other recent examples of this commitment are 311 ONLINE, video streaming of City Council meetings, and the enhanced 'For Residents' section of the City's website. This project will create a data catalogue that provides information already available on the City of Edmonton website in a more accessible format to residents and IT application developers.

4. Is the project itself, or the goals of the project, supported by any City/Department business plan, policy, directive etc.?

- COE Strategic Plan
 - Improve Edmonton's Liveability – improve community engagement and participation
 - Diversify Edmonton's Economy - Improve, continuously, the capacity and capability of the organization in the delivery of services to business and residents.
- 2010 ITB Strategic Plan
 - Open Data is one of the key initiatives of IT Branch's 2010 Strategic Plan

II. Purpose and Benefits of Open Data Project

1. The purpose of the project

- Improve the accessibility of public data by making it available in formats that can be used for additional analysis and IT application development.

2. The benefits of the project

- The catalogue will enable the City departments to easily share public information and enhance engagement and collaboration with residents.

3. The business needs being addressed by this project

- A cost effective mechanism for easily sharing public data with residents and IT application developers

III. COLLECTION OF PERSONAL INFORMATION

The FOIP Act governs how the City of Edmonton may collect personal information, and limits the amount of personal information can collect.

Discuss the following points:

1. List the sources of personal information used by this project.

- The information within the scope of the project is not considered personal information as it is already available on our website (www.edmonton.ca)

2. List each element of personal information collected by the project in point form.

- Users of the Open Data service have the option to contact the City to provide feedback on the service, or ask questions about the service. This is done by email, therefore we may, if so desired, collect email addresses and Names for correspondence under these circumstances.

Personal Information Collected	Source of Personal Information
1. Name	Entered from a paper form filled out by individual
2. Email Address	Entered from an e-mail change of address form sent by the individual

3. Detail the legal justification for the collection of personal information by this project.

- To carry on correspondence, if the user of the services chooses to provide feedback, or ask questions about the service.

4. Whether there any programs in place to ensure accuracy of the personal information collected by program.

- Not applicable

IV. USE OF PERSONAL INFORMATION

The City of Edmonton may only use personal information in accordance with the *FOIP Act*. This means that we can only use personal information for the purpose for which it was collected or compiled or for a use that is reasonably consistent with the original purpose.

Reference: *FOIP Act*, s. 39(1)(a) - A public body may use personal information only for the purpose for which the information was collected or compiled or for a use consistent with that purpose.

Discuss the following points:

1. Whether the personal information contained in the program used for the purpose for which it was originally collected

OR:

2. Whether the personal information contained in the program is used for the purpose that is reasonably consistent with the purpose for which it was originally collected. If so, explain how the new purpose is consistent with the original.

V. DISCLOSURE OF PERSONAL INFORMATION

The *FOIP Act* limits the circumstances under which the City may disclose personal information.

Discuss the following points:

1. List all of the personal information that may be disclosed by or through your program, and the circumstances under which that disclosure could or would take place;

Also:

2. Indicate whether the individual whose personal information may be disclosed has been given a chance to consent to that disclosure.

You may want to put this information into a chart form. An example is provided below:

- Not Applicable

VI. ACCURACY OF PERSONAL INFORMATION

The *FOIP Act* requires that the City make every effort to ensure that personal information in our custody and control is accurate and complete.

List:

1. All controls that are in place to ensure that personal information contained in the program is accurate.
2. What procedures are in place so that personal information that is inaccurate may be corrected.

VII. RETENTION

The *FOIP Act* mandates that the City retain personal information for a set period of time so that the individual has a chance to access it.

List:

1. The retention schedules and/or practices that are or will be in place for the personal information contained in this project.
- Not Applicable

VIII. CUSTODY AND CONTROL

The *FOIP Act* applies to all records in the custody or control of the City of Edmonton.

Discuss the following points:

1. Who has custody of the records containing personal information?
 - Not Applicable

2. **Where the records are physically located.**
 - Not Applicable
3. **If there multiple copies of identical records containing personal information. If so, give location of each copy and reason why the copy was made (i.e. taped back-up made weekly, located in disaster recovery center)**
 - Not Applicable
4. **Whether the City has the power to manage, restrict, regulate or administer the use and disclosure of the record containing personal information.**
 - Not Applicable

IX. SECURITY AND CONFIDENTIALITY

The *FOIP Act* states that all public bodies have an obligation to protect personal information from unauthorized access, collection, use, disclosure, or destruction.

Briefly discuss:

1. **The privacy training received by employees (including contractors) that have access to personal information**
 - Not Applicable
2. **IT access controls that are in place for the project**
 - Administrative access to the data catalogue site is restricted to three individuals within the IT Branch
3. **Physical security of the information**
 - The data catalogue is hosted on Microsoft's cloud platform (Windows Azure) that will soon be pursuing ISO27001 certification.

X. NOTIFICATION TO INDIVIDUALS

Whenever the City collects personal information directly from an individual, the FOIP Act requires us to inform the individual we are collecting information from of:

- the purpose for which the information is collected;
- the specific legal authority for the collection;
- title, business address and business telephone number of an employee who can answer the individual's question about the collection of that personal information.

This notice usually takes the form of a 'FOIP Statement', and is typically located on the bottom of many City forms used to collect information from an individual.

If your project collects personal information directly from individuals, and it has one (or more) of these FOIP statements, please include it (or them).

Or:

If your project does not have a FOIP statement, indicate this, and we would be happy to arrange for one to be written.

Not Applicable

XI. FLOW OF INFORMATION

One of the primary concerns of the PIA process is the flow of personal information into and out of the project. This flow may be internal (ie: between different areas of the same department, or between entirely different City of Edmonton departments), or it may be external (i.e. between the City of Edmonton and outside organizations). Frequently, information flows are both internal and external.

Make a flow chart, showing where each element of personal information that you identified in Section III of this document flows outside of your department (if anywhere).

Not Applicable

Akwesasne
(as submitted)

Jacaban2, Evalynne (INFC)

From: SC / VI (INFC)
Sent: March 7, 2019 12:00 PM
To: [REDACTED]@akwesasne.ca
Subject: Smart Cities Challenge - Successful Final Proposal Submission

Dear [REDACTED]

Congratulations! Your submission is ready to move onto evaluation following a completeness check (per the latest FAQs).

Thank you for your cooperation, patience, and hard work, especially during the past eight months. We are truly honoured to have worked with you and wish you the best of luck in the competition!

On a related matter, we have recently determined that it will not be feasible to post final proposals on the Infrastructure Canada website in a timely manner. Instead, we will take an approach similar to the application stage and publish your executive summary in both official languages on the Infrastructure Canada website with a link to the final proposal on your website. We understand that posting the final proposal on your website is not a requirement contained in the finalist guide so we appreciate your cooperation in facilitating access to your final proposal in an open and transparent way. Please note that the accessibility materials you have prepared for your final proposal will still be helpful in preparing various communications products to promote and share knowledge of your work.

Once you have posted your final proposal on your website, please send us the link if you haven't done so already. If you anticipate that you will be unable to post your final proposal on your website within two weeks, please let us know.

As always, we are happy to answer any questions. The best way to reach us going forward would be at our generic account: infc.sc-vi.infc@canada.ca.

Thank you.

Smart Cities Challenge Team
Infrastructure Canada
infc.sc-vi.infc@canada.ca

COMPLETE CHECK FOR FINAL PROPOSAL

FINALIST: Akwesasne				
ASSESSED BY: Amanda Aizlewood				
VALIDATED BY: Alex Long				
APPROVAL BY: <i>select one: Jenny Tremblay / Eric Poirier</i>				
DATE OF COMPLETION: <i>enter date when all completed boxes are checked</i>				
REQUIREMENTS	COMPLETED	IF NOT COMPLETED, NOTE REASON	GUIDING PRINCIPLES	ACTIONS
SUBMISSION				
Submitted to infc.sc-vi.infc@canada.ca by 23:59 PST on March 5, 2019	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> No extensions will be granted No exceptions will be made for lateness or technical problems (finalist must be able to show evidence of submission) 	<ul style="list-style-type: none"> # to contact finalist If not resolved, # to flag to DG for decision
Final proposal is submitted	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> No extensions will be granted There is flexibility on the finalist video until the end of the week 	<ul style="list-style-type: none"> Assessor to save everything in designated folders # to contact finalist if anything is missing If not resolved, # to flag to DG for decision
Finalist video is submitted	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> There is flexibility on the finalist video until the end of the week 	<ul style="list-style-type: none"> Assessor to save everything in designated folders # to contact finalist if anything is missing If not resolved, # to flag to DG for decision
Preliminary Privacy Impact Assessment or Preliminary Rationale Analysis	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> No extensions will be granted 	<ul style="list-style-type: none"> Assessor to save everything in designated folders # to contact finalist if anything is missing If not resolved, # to flag to DG for decision
FINAL PROPOSAL				
Written in one of Canada's official languages	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> If the final proposal is submitted in a language other than English or French, a companion version in English or French is required from the finalist 	<ul style="list-style-type: none"> # to extract the executive summary from the final proposal and send it to translation (if a French final proposal, send the entire document to translation)
Generally readable (e.g. picture is not covering text, text are not overlapping)	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> If there are serious formatting issues that hinders readability, the finalist may need to resubmit 	<ul style="list-style-type: none"> # to do a scan of the final proposal and verify that all text and tables, graph, etc. could be read
Text-based and in either MS Word (.doc or .docx) or a fully readable, searchable, and selectable PDF (.pdf) format	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> Finalist may adjust the format for INFC posting purposes after the deadline 	<ul style="list-style-type: none"> # to verify with Comms if format is suitable for posting, given INFC web accessibility standards If not suitable, # to contact finalist
No longer than 75 pages* (Financial chapter exempted) and in 12 point font	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> Finalist cannot adjust content after the deadline If the text overall is smaller than 12 point font, INFC will adjust and evaluate within the new page count 	<ul style="list-style-type: none"> # to notify finalist if final proposal is over 75 pages # to notify finalist if INFC had to adjust the font and page count

Contains an executive summary	<input checked="" type="checkbox"/>			<ul style="list-style-type: none"> # to QC and save translated version into the designated folder
Organized by these distinct chapters (not limited to these; not necessarily in the same order): <ul style="list-style-type: none"> Vision Performance measurement Project management Technology Governance Engagement Data and privacy Financial Implementation phase requirements 	<input checked="" type="checkbox"/>	List any other chapters if necessary	<ul style="list-style-type: none"> Finalist must have these chapters Finalist can have more chapters Finalist can change the order of the chapters 	<ul style="list-style-type: none"> If the chapters are not clearly labeled, # to do a light analysis of where the content may be and make a note for the Jury
FINALIST VIDEO				
No longer than five minutes	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> Finalist may cut down the time for INFC posting purposes after the deadline 	<ul style="list-style-type: none"> # to notify finalist if video is longer than five minutes and needs cutting down
Submitted as a file or in a downloadable format	<input checked="" type="checkbox"/>		<ul style="list-style-type: none"> Finalist may adjust the format for INFC posting purposes after the deadline 	<ul style="list-style-type: none"> # to verify with Comms if format is suitable for posting, given INFC web accessibility standards If not suitable, # to contact finalist
CONFIDENTIAL ANNEX (OPTIONAL)				
Submitted if and only if required	<input checked="" type="checkbox"/>	Submitted.		<ul style="list-style-type: none"> # to flag with DG if confidential annex is lengthy

Jacaban2, Evalynne (INFC)

From: [REDACTED] <[REDACTED]@akwesasne.ca>
Sent: March 6, 2019 8:27 AM
To: SC / VI (INFC)
Cc: Bouchard, Kathleen (INFC)
Subject: Final Proposal 75 Page -Mohawk Council of Akwesasne

This document is exactly the same as the first Document set at the 75 Page count

[REDACTED]

Please accept this document in place of the one sent yesterday
Absolutely no change were made [REDACTED]
They are the same

[REDACTED]
[REDACTED]
Mohawk Council of Akwesasne
Phone [REDACTED]

Please consider the environment before printing this e-mail.

Jacaban2, Evalynne (INFC)

From: Bouchard, Kathleen (INFC)
Sent: March 6, 2019 8:26 AM
To: [REDACTED]
Cc: SC / VI (INFC)
Subject: RE: Final Proposal Mohawk Council of Akwesasne

Ok, no problem. We'll fix it this morning.
 Kathleen

From: [REDACTED] [mailto:[REDACTED]@akwesasne.ca]
Sent: March 6, 2019 8:27 AM
To: Bouchard, Kathleen (INFC)
Subject: Re: Final Proposal Mohawk Council of Akwesasne

OMG Kathleen

[REDACTED]

[REDACTED]

From: "kathleen bouchard" <kathleen.bouchard@canada.ca>
To: [REDACTED] <[REDACTED]@akwesasne.ca>
Sent: Wednesday, March 6, 2019 6:06:08 AM
Subject: RE: Final Proposal Mohawk Council of Akwesasne

Hello [REDACTED] Yes, I can confirm this was received through our generic inbox. Thank you for pulling everything together, we'll be in touch if we have any questions.

Wishing you and the team a fantastic end of week and best of luck!

Kathleen

From: Rhonda M. Adams [mailto:rhonda.adams@akwesasne.ca]
Sent: March 5, 2019 9:47 PM
To: Bouchard, Kathleen (INFC) <kathleen.bouchard@canada.ca>
Subject: Fwd: Final Proposal Mohawk Council of Akwesasne

@ 8pm I emailed this to info.sc-vi.info@canada.ca

ATIA - 19(1)

I have received no response for confirmation.

I am hoping that you can verify with them the receipt when you get in
in the morning.

Thanks for your help

[REDACTED]

[REDACTED]

From: [REDACTED] <[REDACTED]@akwesasne.ca>
To: "info sc-vi info" <info.sc-vi.info@canada.ca>
Sent: Tuesday, March 5, 2019 8:03:12 PM
Subject: Final Proposal Mohawk Council of Akwesasne

The Full Final Proposal was shared to smartcitiescanada account on google.

Also supplied here is the link to the document

[REDACTED]

attached in this email (2/2):

are 2 documents the short form preliminary impact assessment and the confidential annex.

Please email [REDACTED]@akwesasne.ca [REDACTED]
with any further questions regarding the Smart Akwesasne Project.

Our final proposal will be posted tomorrow on the webpage www.akwesasne.ca/smartakwesasne

Niawen

Thank you,

[REDACTED]

[REDACTED]

akwesasne.ca/smartakwesasne

Jacaban2, Evalynne (INFC)

From: [REDACTED] <[REDACTED]@akwesasne.ca>
Sent: March 5, 2019 4:27 PM
To: SC / VI (INFC)
Subject: Finalist video - Mohawk Council of Akwesasne

Hello,
We've shared the finalist video through google drive. Can you send me a confirmation that it is received and accessible? It is an MP4 format.
Thanks,

[REDACTED]

Mohawk Council of Akwesasne

[REDACTED]

Jacaban2, Evalynne (INFC)

From: SC / VI (INFC)
Sent: March 5, 2019 4:49 PM
To: [REDACTED]
Cc: Bouchard, Kathleen (INFC)
Subject: RE: questions

Thanks [REDACTED] the video was well received and looks great. We just finished watching it. Feel free to send the documents via the same link. We are still here for a while waiting for submissions. Note that we will also be sending an automatic reply after 5pm

From: [REDACTED] [mailto:[REDACTED]@akwesasne.ca]
Sent: March 5, 2019 4:45 PM
To: Bouchard, Kathleen (INFC) <kathleen.bouchard@canada.ca>
Subject: RE: questions

Hi Kathleen,
 We shared the finalist video so far with the smartcitiescanada@gmail.ca, we are currently waiting confirmation that the video was shared okay, it was too big to send over email. The video is mp4 format. The final proposal and accompanying documents will be sent over this evening, or shared on google like the video was. We just want to make sure that everything made it over okay [REDACTED]
 [REDACTED] will be sending the proposal this evening.

Thanks,

[REDACTED]

Mohawk Council of Akwesasne

[REDACTED]

----- Original Message -----

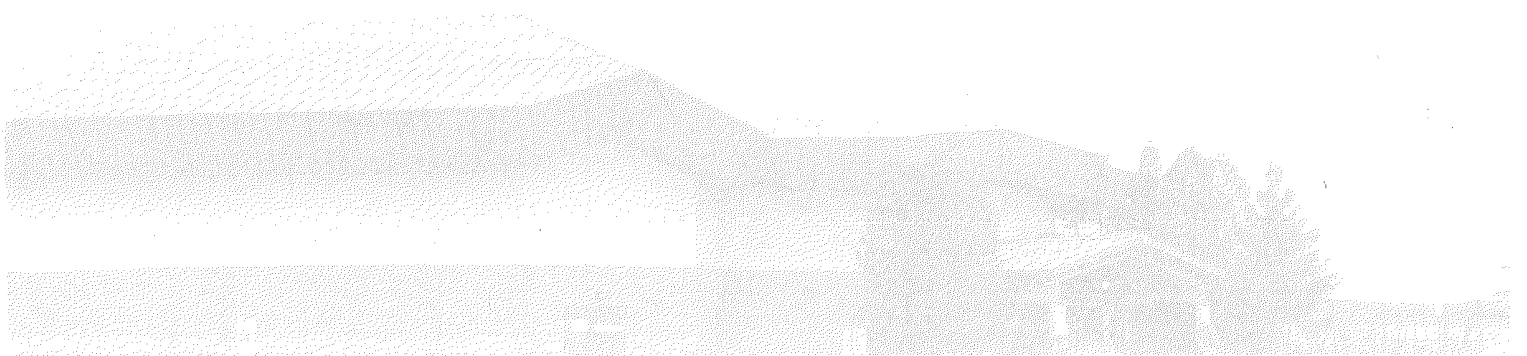
From: Bouchard, Kathleen (INFC) <kathleen.bouchard@canada.ca>
To: [REDACTED] <[REDACTED]@akwesasne.ca>
Sent: Tue, 05 Mar 2019 11:10:19 -0500 (EST)
Subject: RE: questions

@font-face
 {font-family:Wingdings;
 panose-1:5 0 0 0 0 0 0 0 0;}
 @font-face
 {font-family:"Cambria Math";
 panose-1:2 4 5 3 5 4 6 3 2 4;}

**Page(s) 1501 to 1503
are withheld
pursuant to paragraph
20(1)(b) and 13(1)(e)
of the *Access to Information Act***

**La/les page(s) 1501 à 1503
Font l'objet d'une exception totale
conformément aux dispositions de paragraphe
20(1)(b) et 13(1)(e)
de la *loi sur l'accès à l'information***

Smart Cities Challenge Proposal



March 5, 2019
Akwesasne Submission


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AKWESASNE MOHAWK COUNCIL RESOLUTION	File Reference: _____
MCR #: <u>2018/2019 #346</u>	



THE	MOHAWK COUNCIL OF AKWESASNE	THIS MEETING TOOK PLACE IN THE TERRITORY OF AKWESASNE WITH THE FOLLOWING MEMBERS OF THE AKWESASNE MOHAWK COUNCIL PRESENT: 
AGENCY	SOUTHERN ONTARIO DISTRICT	
PROVINCE	ONTARIO/QUEBEC	RECORDED VOTE For: <u>9</u> <input checked="" type="checkbox"/> Carried Against: <u>0</u> <input type="checkbox"/> Denied Abstention: _____
PLACE	Administration 1 Building	
DATE	<u>4</u> <u>March</u> <u>2019</u> <small>Day Month Year</small>	

DO HEREBY RESOLVE:

Moved: Tim Thompson

Seconded: Theres Jacobs

WHEREAS, the Mohawks of Akwesasne have the existing and inherent right of self-determination, which includes the inherent jurisdiction over their lands, peoples and territory;

AND WHEREAS, the Mohawks of Akwesasne have the aboriginal and treaty rights, and other rights and freedoms that are recognized and affirmed in the Constitution of Canada, which include the inherent right of self-determination and jurisdiction over their lands, peoples and territory;

AND WHEREAS, the Mohawk Council of Akwesasne is the community government within the territory of Akwesasne and has inherent jurisdiction to make laws, regulations and policies to meet the needs and concerns of the Mohawks of Akwesasne;

AND WHEREAS, the Mohawk Council of Akwesasne intends to preserve the cultural, political and economic integrity of the Mohawk territory and community of Akwesasne;

WHEREAS, Infrastructure Canada announced Canada's Smart Cities Challenge in the fall of 2017, which is a competition open to municipalities, local or regional government, and indigenous communities (First Nations, Inuit and Metis) across Canada; and

WHEREAS, the Mohawk Council of Akwesasne (MCA) staff, leadership and technicians discussed the Smart Cities Challenge and worked with a digital consultant on framing the Challenge Statement for submission; and


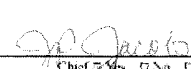
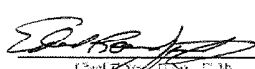

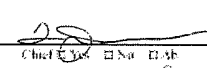
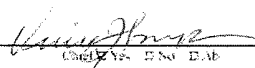
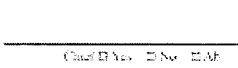
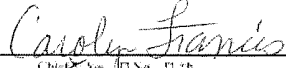
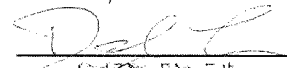

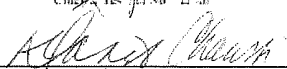
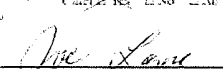
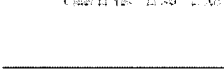
WHEREAS, Mohawk Council of Akwesasne submitted the finalized challenge statement was selected as a finalist for the Infrastructure Canada Smart Cities Challenge; and

WHEREAS, The Smart Akwesasne Team worked diligently on collecting community input and formulated the criteria for the compilation of the final proposal submission; and

WHEREAS, The final proposal is now complete and has been prepared for submission;

THEREFORE BE IT RESOLVED THAT, The Mohawk Council of Akwesasne approves the final proposal and supports its submission to Infrastructure Canada for consideration in the Smart Cities Challenge.

CARRIED

 Tim Thompson <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Ab		
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Executive Summary

Our Smart Cities Challenge: To reduce the prevalence of new cases of diabetes at Akwesasne to the rate of the Canadian average. Our goal looks rather humble, to only be as bad off as the rest of the Canadian population. With this statement, however, the people of Akwesasne draw a line in the sand against the existential threat of diabetes. And our work maybe beneficial to others: Recent research reviewing 111 studies worldwide confirmed a disproportionate burden of diabetic disease complications among all Indigenous peoples regardless of their geographic location.

(From: Global complication rates of type 2 diabetes in Indigenous peoples: A comprehensive review)

We recognize that the situation Akwesasne folks now face was ultimately caused by our loss of traditional ways. A steamroller of westernization disrupted our traditional lifestyles, polluted our natural food sources, and dropped on top of the Akwesasne territory three complicating political jurisdictions, not of our making. Our skills and competencies in the old ways lost relevance. Our elders' ability to provide guidance using traditional teachings and ceremonies was derailed. The temptation of western consumptive habits and modern food, that is, frankly disease causing exacerbated our genetic susceptibility for diabetes, as did our now overly sedentary lifestyles. Our traditions sought to preserve our unique relationship with the environment, to make us a sustainable society. This has been replaced by our acceptance of living in a negatively altered

state, and of accepting the need for modern medicine, which does not bring us back to health. It does not cure but keeps us in a state of perpetual decreased vitality.

But how to reverse this trend towards ever worsening health? How can we address this problem in a new way?

We became aware of how organizations and industries were re-inventing themselves and disrupting their existing situation for the better through the use of Design Thinking. With our partners, we learned how to get to the root of our problem, and how to come up with ideas to solve the problem.

We wanted to have all of our community involved. We wanted to make our work transparent so our residents' relationships with our public organizations and with each other would be stronger. We wanted our people involved so the solutions that are



designed will work for our people because they were part of developing where we are going at every step.

We started by looking over everything we had previously studied. We brought together our people singly, in groups, and remotely through surveys and phone calls. We discussed and identified problems. We thought of over 100 causes and solutions and then arrived at key insights regarding our predicament. We determined that the precursors leading to high levels of diabetes are related to these rather straightforward factors:

- Food Accessibility
- Network Accessibility
- Transportation Accessibility
- Westernization
- Checkup Frequency in Health and Dental
- Healthcare System Disconnection
- Loss of target demographic following primary school.

(These will be explained in detail later in our proposal).

We learned that the way forward for the health of Akwesasne must be a multipronged approach, working on many battle fronts at the same time. In our own traditions of health we remember from a Haudenosaunee perspective Goodmindedness, Peacefulness, and Strength are synonymous with a unified mind, body, and spirit concept. Similarly, our ability to achieve a healthy state will

focus on four pillars that summarize our insights: Wellness, Tradition, Access, and Measurement. These Pillars will become themes for our actions in our Smart Cities approach, and take the form of new tools, and a new way of communicating, remembering and teaching. With the help of technology, the way forward is for us to accurately understand our own condition, organize ourselves for change and then make change happen in measurable, adjustable ways.

In the big picture we are where we are because we could not adapt when westernization and industrial technology changed our environment. This is the same story for Indigenous people the world over and is also a story of misused power. While it is regrettable our current environment offers us much less in many ways than it once did, it also has new things in it. Our elders could walk into the bush and point to dozens of things that had nutritional, medicinal or cultural uses. Now our environment has technologies and machines that we need to recognize as useful and use. And not just use, but develop our own skills in their use.

In the years since we were forced to abandon traditional ways and lost our self-sufficiency, the spirit of our community was also damaged. The disruption to Kanikonhriio or Goodmindedness, and Sken:nen or Peacefulness, led to the loss of our strength in looking after ourselves and each other. It weakened our self-worth, our contribution of shared effort, our access to teachings; all were made difficult. Even food in our own territory can no longer be



drawn from the river or grown safely.

Yet the strength of our community can be reinvigorated, especially if we tackle the issue of diabetes. We can make use of new technologies such as mobile communication to help us function like a community again. Systems can be introduced that will make us strong together by keeping us in touch, by responding to each others requests for help or to learn; we can share our learnings and join one another in healthy activities, and get to know one another.

Our health challenges are made harder because we don't know one another. Not in the causal sense of knowing but in the sense that our health services don't have proper information on our individual health. The fracturing of our community across jurisdictions and health districts means we can hardly even know ourselves in the sense of having an accurate medical history, often spread across provinces and countries. So how can we understand the health status of our community or plan to improve it? A mobile application, designed for the purposes of organizing us and our information can give us back this glue that can make us a community again. Modern tools can make our problems understandable, and allow us to find insights into our condition so we can develop ways to reverse our maladaptation to this still relatively newly imposed environment.

Now, in thinking about how technology can help Akwesasne, and what the Smart Cities challenge may permit us to

accomplish, we started with a new way of thinking as a group. Design Thinking helps organizations innovate, which is really just a word for adapting. And this approach allowed us make up time for those years when we weren't adapting; we wanted to move ahead but had trouble deciding what needed to be done. Now we have gone over what we know, focussed on a challenge, engaged our community, developed some momentum and made a plan that uses smart technologies as an antidote for the issues caused by previous modernization.

Akwesasne has recognized the Smart Cities Challenge as an opportunity to face our hardest challenge. It has brought our community together and we have found a way to organize ourselves to move forward. While much of the world's technology had caused problems for us in the past, we will now use technology as a raw material to regain our vitality.

Our plan for adoption of technology will be on our terms. Our project probably does not seem earth shattering, which is a rate of change we find disconcerting, anyway. Through the use of about a dozen electric vehicles, the construction of 3 greenhouses adopted by the school curriculum, and a mobile application we can put in everyone's hand we plan to attack the 4 pillars of our challenge. With this limited investment in machines and software we will address the insights about our predicament.

Key to organizing the strength of our community will be the mobile and administrative coordination tool we are calling the Akwesasne Community



Application. This brings everything together by providing communication amongst our people, coordination of services, access to food and community programs, measurement of service efficiency, and tracking of individual health. With these tools and oversight, we will make progress on our challenge, and reduce the rate of new disease to the rate of other Canadians. It would be nice to target the rate of diabetes in our people of 200 years ago, but for now it will be a major goal to achieve the health of other Canadians.

Our success will represent a watershed in our history. This will be where we began to defeat the most significant health risk for our people. This is where we began to improve the most significant factor for achieving a happy life, that being good health. Our elders knew how to make the most of what the environment offered; we can use that approach again. Tech is like a new herb, we must understand and use it. We will put it to use without obliterating the traditions that are our identity. We will use it while maintaining harmony with the environment.

We can use new things like e-cars and e-buses to get where it is important to go, without adding to the toxic load by burning oil. We can use greenhouses to replace our polluted food sources and gain back a measure of self-sufficiency. Mobile and computer programming can bring back the sharing and helping on which our strength as a nation was based. Digital tools will give us access to our collective memory and to the wisdom of our traditions, from which we regain pride necessary for our

progress as a people. Our traditional teachings shows how strength is based on things working together. We will use that approach to work on many things at once to reverse the main threat to our health.

We believe this solution is extensible. Our package of ideas, with its mobile technology, databases, integration of health devices, location sensing, health diagnostics, statistics, transportation logistics, electric vehicles – these are all details to be adjusted for each case. At the center, however, will be the open-source system that is the hub of the services, and this is a non-proprietary system suitable for hosting anywhere. What we have learned, the approaches we take, the way we integrate the very new with the old will surely be helpful to aboriginal nations across Canada and the world over.

We are not the only people whose nation has been knocked out of harmony with the environment because of colonialism. We are not the only aboriginals whose communities were disfigured by imposed change and 'progress'. Regardless of cause, other indigenous people around the world are vulnerable to developing diabetes at the rates we are. They would surely benefit from our experience with this project. They would be welcome to our technology.



Vision

The goal of our Akwesasne Smart Cities Challenge is to leverage smart technologies to reduce new cases of diabetes in Akwesasne to the Canadian national average. Six months ago our preliminary proposal laid out four pillars of focus, and we hold true to that vision in both our process and outcomes. These four pillars are improving approaches to community wellness, incorporation of holistic Indigenous practices, improved access to community services, and finally, tracking of health diagnostics for a measurable approach.

Community Wellness

The approach to our first pillar, community wellness, calls for making existing opportunities more accessible, increasing the number of people taking advantage of these initiatives, while simultaneously improving the existing systems supporting them. The Mohawk Council of Akwesasne, Community Health and numerous individuals in the community provide a number of opportunities for the improvement of physical, mental, spiritual and emotional wellness in their community. These programs include The Green Food Bag, a service offered by the Department of Health, which provides fresh fruit and vegetables to households at a low cost on a monthly basis; daily yoga, pilates and fitness classes at the recreational center, free cooking, knitting, art, and taekwondo

classes. Also provided is an adventure club that takes groups of individuals outdoors to experience nature through hiking, bike rides, fishing, and other activities. These are just a few of the many programs and opportunities available to the people of Akwesasne. Unfortunately, participation rates are rather low with stagnant growth uptake. Many individuals are restricted to the programs in their own district or are unaware of when and where things are happening. Our proposed solution will address these impediments in a multi-faceted approach, through improved intrinsic motivators of awareness; ease of scheduling and community connection; by improving accessibility via more affordable transportation, and through measuring the effects of our efforts to further improve existing services.



Adding to the lack of community wellness is the barriers to healthy food sources within the community, including long drives to grocery stores, and high levels of mercury in both the Saint Lawrence River and surrounding soil, stealing our traditional practices of gardening. To address the issue of food insecurity and inaccessibility, we will implement three Smart Greenhouses through a phased roll-out approach at each of the Akwesasne Mohawk Board of Education (AMBE) Schools locating one in each district. The intention of this project is to first create a curriculum based on agricultural education teaching years 6 through 13 on how to grow fruits and vegetables with the importance of a healthy diet. The second goal of this project is to help address the transportational barriers by using students as a vehicle to get healthier options onto young families tables. Lastly, gardening promotes physical health, mental health through stress relief, exercise, brain health, nutrition, and healing, which is not only a contributor to reducing pre-diabetes, but also following the teachings of our Indigenous and Mohawk practices.

Our Greenhouse implementation is planned to be fully automated including temperature control, the amount of light saturation, humidity levels, soil moisture as well as other factors. Smart greenhouses can be controlled remotely over the cloud through an application, eliminating the need for a person to be present for most operational needs. By using IoT, sensors and actuators, factors such as temperature and humidity can be monitored remotely,

and changed based on needs to create the most viable growing environment for the products. Although fully automated, connecting children with the natural world and allowing them to explore the outdoors, including our school gardens, will be an integral part of our integrated curriculum. Students work in the garden, weeding, watering and tending to the beds. Classes utilize the space for lessons in science, social studies, math, reading, writing, and painting. A living laboratory, children are growing, experimenting, observing, measuring, comparing, and learning to care for something that is important to the Akwesasne Mohawk Board of Education and to sustainability efforts around the world. A garden is as much a story about the people who create it as it is about the garden itself. School Greenhouse Gardens are spaces for "hands-on" education, incorporating the full cycle of learning associated with healthy food - from growing to nutrition to cooking and eating. This will provide hands-on learning experience and a living classroom for Akwesasne.

Incorporation of Indigenous Community Practices

Many of the issues we face, and particularly the challenge we are experiencing with diabetes, can be attributed to the loss of the traditional ways of diet, activity levels and mindset. To tap into the strength of our traditions we will be integrating these cultural beliefs that served us well for centuries. These practices, even if put to use in combination with modern



technologies, will once again help us regain our vitality.

Our intention to incorporate Indigenous Community Practices means we will approach health and wellbeing from more than just the modern clinical perspective. Akwesasne is part of the Haudenosaunee Confederacy and remains connected to our traditional roots. Holistic Indigenous practices encompass three principles that were introduced to our people as the Peacemaker traveled the land: Kankonhriio or Goodmindedness, Sken:nen or Peacefulness, and Kasastensera or Strength. This teaching became known as the Great Law of Peace. Essentially, what the Peacemaker taught throughout the territory was that the practice of Kanikonhriio or Goodmindedness would bring Peace or Skennenkowa to the people in the land. When the Peacefulness was pervasive through the territory, the people would gain a Strength or Kasastensera that could not be overcome by negative forces. From a Haudenosaunee perspective Goodmindedness, Peacefulness, and Strength are synonymous with the concept of mind, body, and spirit. This holistic approach to wellness has gained significant traction in alternative healing practices. The popularity of respecting the interrelationship of mind, body, and spirit is undoubtedly due to its effectiveness, especially in combination with modern medicine or as an alternate. In the Haudenosaunee Wellness Model, the 'health' of Haudenosaunee individuals, families, clans, communities, nations and overall confederacy can be measured using

indicators strictly from our teachings and cultural mores. Likewise, an individual can receive guidance on a process to return to a state of 'health' using our traditional teachings and ceremonies.

The Haudenosaunee Environmental Task Force has proceeded with a project to develop an environmental protection process based on their Indigenous world view and relationship with the natural world. Such a process enables individual nations and communities of the Haudenosaunee to protect and restore the natural world, while helping to preserve their unique relationship with it, as a sustainable society. The process devised criteria and indicators for health of the natural world including people, which has a foundation in Haudenosaunee culture and traditions.

Through our Smart Cities Challenge proposal we keep these teachings and values at the center of all solutions, smart or otherwise. The Akwesasne Community Application will embrace holistic Indigenous practices through the teachings it contains the insights it provides to users, and the accessibility of these resources. The application will simply provide the means for the people of Akwesasne to achieve and maintain Good Mindedness, Peacefulness and Strength.

Improved Access to Community Services

The geographical footprint of Akwesasne is unique and includes jurisdictions in Ontario, Quebec and the state of New York. For many citizens, significant distances, travel



times and border delays both ways impact accessibility to major services. This limits our access to facilities and infrastructure where physical health, fitness activities and training are provided as well as accessibility to fresh, healthy food.

Without personal vehicles, getting between major public hubs or to a grocery store, fitness and recreation centers, or healthcare providers is unfortunately challenging, and a real impediment to these trips occurring. Right now Akwesasne relies solely on taxi-cab. These companies — based out of surrounding cities Cornwall, Ontario and Massena, New York — charge high rates to travel into the districts of Cornwall Island, St. Regis, and St. Snye. Additional charges accrue due to the extremely sparsely populated community and additional drive time to come into the reservation. Our plan in overcoming this challenge is to bring affordable and accessible public transportation to the community of Akwesasne. To do this we will organize a Mohawk Council of Akwesasne (MCA) subsidized taxi-cab service, as well as designing and beta testing a project for on-demand electric public transit bus services. Through these two transportation initiative we will facilitate the important movement of our citizens between our districts and to needed services including fitness and recreation centers, healthcare providers in various locations and to purchase food at grocery stores. Through a phased roll-out approach we will begin by purchasing an electric vehicle per district in order to gain feedback on the program and truly understand our capacity requirements.

Based on the preliminary research this will lead to four cars per district, a total of twelve cars as allotted in our budget.

Tracking of Health Diagnostics for a Measurable Approach

The prevalence of Diabetes in First Nation communities is disturbing. Diabetes Canada states the rate of diabetes for First Nations individuals living on a reserve is 3-5 times higher than other Canadians. The Canadian national average is 9%. The rate in Akwesasne is 33%. While we plan to include many measurements in the Smart Cities system — to help us understand and influence patterns of behaviour, optimize services and logistics, to provide feedback to help in the iteration of ideas — one measure is preeminent in our challenge: the number of new cases of diabetes in Akwesasne. This one number must be reduced to that of the Canadian national average. This is the goal which all the other pillars and tactics will be organized to achieve.

Consistent with research on diabetes in First Nations populations, the Akwesasne rate is more than three times the Canadian average. Through the aggregated data received from the Akwesasne application, CANRisk surveys completed within the application, individuals referred to the diabetes prevention and management team as well as the number of new cases of diabetes in Akwesasne, we can measure the relation between our efforts and the Smart Cities Challenge initiatives with a real change of diabetes in Akwesasne.



(CANRisk surveys provide questions that help individuals determine if they are at higher risk of having pre-diabetes or type 2 diabetes.)

Apart from the measuring of health outcomes and diagnostics indicative of medical issues, our work with the Mohawk Council of Akwesasne Executive team also narrowed in on Key Performance Indicators that would indicate if our solution was having a positive effect on the factors contributing to health outcomes; for example, were our chosen tactics shown in the behaviors of the community? Were our solutions achieving key objectives? The Akwesasne Community Application and digital ecosystem through which transportation and participation rates can be collected and analyzed is central to the measurement and understanding of these contributing KPI's.

To address this pillar, and the key performance indicators contributing to your Challenge statement we will collect and aggregate all of the data gathered from the application including CANRisk survey results, usage rates of programs and services, and progress of health metrics in aggregated form and display it in a dashboard view for the Mohawk Council of Akwesasne. This will allow us to understand both baseline data within our community and understand how our efforts are relating to decreasing the new cases of diabetes.

With these four pillars — Wellness, Tradition, Access, and Measurement — at the center of our Smart Cities Challenge,

we will improve community wellness by developing better services while creating more affordable access to them. We will incorporate Indigenous Mohawk culture to tap the wisdom held in our traditional teachings and approach all issues with a more holistic mindset respectful of nature. All the while measuring movement towards targets, to show proven results or highlighting a need to adapt to better serve our people.

Reflective of the true needs of the community; as demonstrated through a compelling body of data and evidence and extensive resident engagement. Ambitious, achievable, and meaningful for the community and it's residents.

A human centered-design approach is based on delivering solutions that meet the true needs of the community, that are meaningful, that are aligned through initial and ongoing engagement with the end users. Consequently, our Smart Cities team has kept Community Engagement at the forefront of our Smart Cities Challenge solution. Over the past seven months, we have implemented the Design Thinking methodology in its many forms, facilitating workshops with important user groups, surveying and interviewing internal and external stakeholders. And, as this information provided direction and formed into ideas, prototypes and application interfaces, we gained feedback from Akwesasne community members on our solutions and how they should iterate via rounds of user testing. Our partners,



zu, knows from experience that it is best to “measure twice and cut once” in designing solutions, which means keep users in the loop until things are completed, or one is likely to complete the wrong thing.

Using the Design Thinking process our outcomes and approach ensures the true needs of the community are served. Community members are the ones who both identified the problems and helped ideate the solutions. They were and are conferred with every step of the way providing feedback on solutions, voting on the best implementation strategies, and user testing our prototypes. In the past consultants sought to implement their own “expert” ideas in prescriptive ways; in Design Thinking, however, users are encouraged to critique things and provide their ideas on what would be a better implementation for the community.

In addressing the question of whether our identified challenge is meaningful to the community, we put forward this data point. During our community engagement events, we surveyed all individuals in attendance and found that 82% of respondents had either suffered from Diabetes themselves or had a family member who did.

Ambitious, achievable and meaningful for the community and its residents

When we look at our Smart Cities Challenge Solution, we believe our challenge statement defines ambition. Despite

advancements in medical treatments and technology, diabetes remains a prevalent chronic disease that afflicts a huge number of Canadians and more specifically, Indigenous people. We recognize that reversing the prevalence of diabetes in Akwesasne requires a strong desire, determination, and hard work. This will mean, first, work to be done by the community and the vendor partners in determining what tools will come into existence, followed by commitment by our community members in engaging in the new systems and supporting these new approaches to health, fitness, and traditional mindsets. It is an ambitious undertaking to address a problem affecting so many individuals in the community, across Canada and around the world. We are excited and driven by the opportunity to create a healthier Akwesasne, as well as creating an approach that is intended to be extensible and actually extended to a much wider population.

Although our challenge is ambitious and potentially far-reaching, we have taken a very practical, grassroots approach to solving it. In looking at the many software project debacles over the past years, we observe the common problem that these systems were designed by experts for the many – but failed for the individual users – and so failed for the many, too. We started with individuals as we believe if our approach can be confirmed to work for one it has a much greater chance of working for the many.

The community is telling us our solution, the one they have helped us to develop is



achievable. While there are more science-fiction oriented tech in existence, our choices, though less appealing, are based on proven technologies with the basic goal of providing our people with better access to the essentials of life.

- Smart Greenhouses Agriculture solutions account for 6% of all IoT projects, giving us confidence in a successful implementation with capable partners in order to cut operating costs and make the most of the available arable land in Akwesasne.
- The use of electric vehicles (EV) continues to grow with nearly 50,000 plug-in vehicles in Canada and the growth of 68% in 2017. Our Smart Cities Challenge will implement this proven technology as an economic and environmentally sustainable approach, which also meets the practical challenges of transportation for people, and the delivery of quality food and services.
- Design Thinking is reshaping service delivery and product design in industries from tech to banking and everything in between. Business consultancies are buying up Design Thinking shops as they have recognized the importance of Design Thinking to organizational strategy and success. We have chosen to use this approach to identify opportunities and problems and to produce solutions always in touch with our citizen users.
- In partnering with zu we are tapping both their expertise in Design Thinking,

but also in their high success rate of creating digital products that centralize an array of components and capabilities. We will create an integrated technological solution that combines mobile applications with an administrative back-end while integrating third-party services and information feeds from other systems associated with services, greenhouse inventories, event scheduling and so forth. Our solution requires us to bring services, educational components, scheduling, information collection, and other capabilities together through a hyper-localized web-application to achieve success through a holistic system of seamlessly flowing parts. The Akwesasne Community Application will be used as an education tool, management software, expeditor of services, and a collector of information.

Well-suited to a smart cities approach

Being a Smart City can mean many things. It can look very different depending on where you are and what is your pre-eminent challenge or opportunity. But the objective is always the same – using technology to create a sustainable future and improve the quality of life for people. As we come closer the end of our finalist phase, we are confident our solution takes on both this Smart City approach to technology, but also its approach to openness, integration, transferability, and collaboration.

Openness derives from our commitment to



building this project with the community, and not for the community. Unlike many technology projects, we are not using a team of experts working in secret to produce something without their input, which our citizens will then be trained to use. Openness is embodied in what this is for and how it will work. Openness is also driving our planned collection and sharing of data and results, which are used to motivate improvement at an individual and group level, so progress can be celebrated as we move towards improved health. And openness also requires transparently communicating data collecting, use and disclosure with our users, always respecting privacy best practices.

Integration is embodied in the development of tools that fit into the lifestyles and activities of community members, rather than requiring our folks change to fit the system. Integration is represented in the interaction and interdependence of the capabilities we plan to develop in the Akwesasne Community Application. Each capacity — education, transportation, access to services and better food — enables or relies on the next, supporting our recognition of the interplay of curative and curative elements associated with our challenge. This dependence of factors is supported by our traditions, where mind, body, and spirit are supportive of a combined single strength. Our traditional teachings tell us there is a wholistic state of balance where maximum strength is attained. Our people can receive guidance on a process to return to a state of 'health' using our traditional teachings

and ceremonies. In this case, technology will help us organize and integrate an additional combination of knowledge, tools, accessibility, transportation, measurement, feedback, health services and nutrition. All facets will be integrated in a virtuous circle to achieve more than the sum of the parts.

From the beginning, the approach has been about engaging our community, being open to ideas and feedback, and relying on even the most basic direction of identifying: What do we want this to be about? We believe that a human-centered design and co-design approach consistently produces a collaborative solution for the people and by the people. When one looks at our Smart Cities Challenge integration is a pivotal piece of it, we bring together Healthcare, Education, Public Transportation, Community Initiatives including recreation Integration is a large piece of our project, bringing together many essential services from nutrition, healthcare, education, executive council, public transportation services, data management, traditional practices, and more into one silo and system to provide seamless and high quality service to the community of Akwesasne. This is what integration means to our Smart Cities Proposal, it means bringing people, business and essential community services together to make them more accessible and affordable through collaboration.

Our strategy to solve the challenge that addresses root causes; it targets opportunities for improvement that also exist for many Indigenous communities the world over. As success is realized our



approach should be shared. Our system ideas and components can be reused, whether as open-source software or as open-source ideas, all non-proprietary. The technologies will be able to be redeployed in other jurisdictions, incorporating modifications for changes in detail relating to specific communities, health measures, locations, educational elements, transportation challenges, targeted medical conditions and so forth.

National survey data has consistently shown that the national age-adjusted prevalence of diabetes is 3 to 5 times higher in First Nations than in the general population. Diabetes within Indigenous communities The higher rate of adverse health outcomes in Aboriginal peoples is associated with a number of factors, including lifestyle (diet and physical activity), genetic susceptibility, and historic political and psychosocial factors, stemming from a history of colonization that severely undermined Aboriginal values, culture, and spiritual practices. Barriers to care that are unique to Aboriginal settings also exacerbate the problem with fragmented healthcare, poor chronic disease management, high healthcare staff turnover, and limited or non-existent surveillance. In addition, social determinants of health, including low income, lack of education, high unemployment, poor living conditions, lack of social support, negative stereotyping and stigmatization, and poor access to health services compound the problem. This is common across Indigenous communities, and we believe the barrier facing the

community of Akwesasne is common across all Indigenous communities big and small throughout Canada. We believe our Smart Cities approach, built with open source tools, solving problems people across Canada are facing makes transferability opportunities endless.

The Mohawk Council of Akwesasne and our digital consultancy zu have come together to build something greater than the sum of its parts. We at MCA bring a wealth of knowledge to the table about the barriers our people face, but also about the capabilities we have, and the strength of our teachings rooted in our culture. zu brings an ability to plan and deploy digital strategy, to build digital tools, and a proven knack for driving digital transformation at municipal, provincial, and federal levels. In combination, we bring an incredible amount of insight and opportunity identification to the Akwesasne Smart Cities Challenge. Our partnership to date has resulted in highly satisfying progress. Because this will be an ongoing battle against the challenge of diabetes and for the pillars of health, and given that technology is a rapidly adapting toolset, we expect this collaboration will span more than the timeline of this Challenge. Together, and with other partners, Akwesasne will foster a sustainable future for our people. And if we are successful, we will seek to share our learnings to improve the quality of life of other aboriginal communities, and others, across Canada and beyond.



Performance Measurement

Using the tools and approaches developed by our solution will enable us to coordinate and collaborate on the necessary changes we need to reverse this plague of diabetes. We bring our sense of community and friendly competition to the table to challenge one another to be our best. The Smart Cities technology we have prototyped will tie in actual results on the behaviours we seek to modify, showing us where to go to next, and transparently reveal whether we are elevating ourselves into a new era of health, or further deteriorating. Our traditional ways will give this new technological approach the heart that it needs in order for it to be relevant to us. The outcome is admittedly ambitious, but it is achievable and so important to achieve.

The outcomes of the success of the implementation of our Smart Cities proposal are measurable first in the principle goal figure of reducing new cases of diabetes, and secondly, in the lifestyle measures that reduce the risk of diabetes.

All measures are available to be measured by our application through unlinked aggregation. These specific measures include.

- The capacity of public transportation
- An individual's distance to programs and services
- Citizen awareness of available programs and services
- Number of people attending public programs and services or using videos within the app.

- Number of people completing in-app challenges or Competitions
- CANRisk surveys completed in-person, and through the Akwesasne Community Application.

Avoidance of diabetes going forward would indicate a major overall improvement in health and well-being for this community, and provide a way forward for other communities that adopt the protocol we will model.

In combining the new digital tools and medical knowledge the modern world provides with our traditional approaches that protected our health and environment in the past, our community will build a modern foundation of health to move forward, as with health, all things are possible.



Project timelines, deliverables, and milestones that are ambitious yet attainable

Our project timeline spans a total of 24 months with notable milestones throughout that frame. Implementation of the application, dashboard, greenhouses and electric transportation system will all fall under this 2-year approach. Broken into a 4 phases, like many software projects, the creation of our application and dashboard will entail the strategy and validation of our findings to date as well as design and development. Working in tandem, the implementation phase of the Greenhouses and Transportation System will be completed with the same time constraints due to feature reliance on application qualities.

- SEE TIMELINE ON PAGE 20

- SEE MILESTONES ON PAGES 22 – 24

Our planned health and wellness initiatives contained in our solution are intended to reduce the prevalence of new cases of diabetes. Measurement is critical to monitoring the impact of these initiatives on stemming new cases of diabetes. In a workshop format organized by our consultants at zu, our Directors of the Mohawk Council of Akwesasne identified key performance indicators believed to capture the essence of our planned approaches. Working collaboratively, we developed 3 core metrics to measure

the effectiveness of our initiatives health and with each metric, we ask 5 critical questions. Our 3 core metric categories are Access, Participation, and Screenings. Our 5 critical questions regarding each KPI are: Why does it matter? What affects it? What can we control? What are the measurables? What are the targets?

Key Performance Indicator #1: Accessibility

The Access KPI is defined as a measure of accessibility by community members to public health and wellness programs. For example, individuals seeking opportunities for active living, seeking health care, or at-risk individuals meeting medical program requirements. Measurable factors include the capacity of public transportation, an individual's distance to programs and services, and citizen awareness of available programs and services.

Why does Access matter? Transportation, location and awareness of opportunities all impact the community's and at-risk individuals' ability to live active lifestyles, obtain healthy food options and take advantage of any services not in their home location.

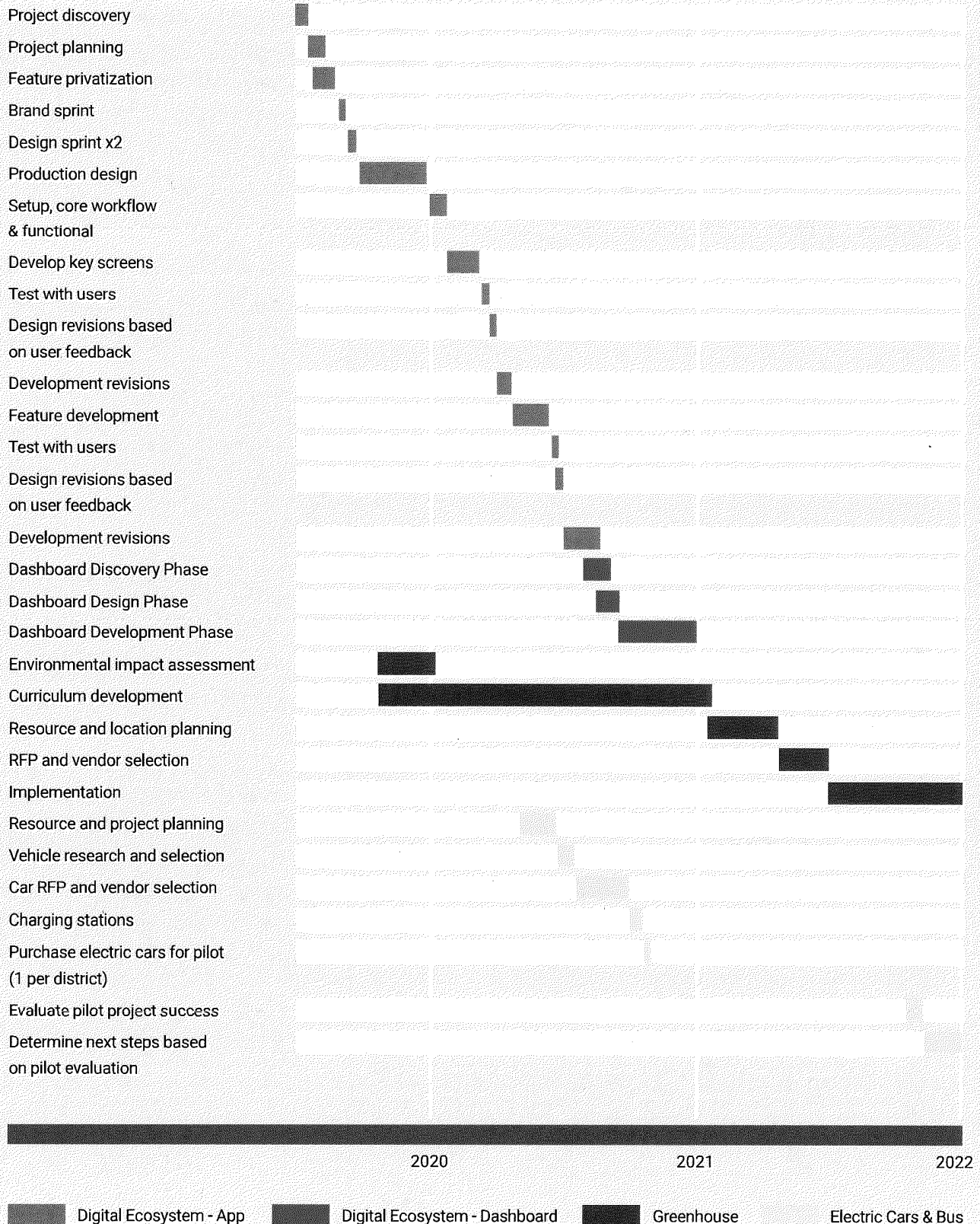
What affects Access? Home location, income, access to public transportation, access to an automobile, distance to the desired service, location of healthy food options.

What can we control about Access? Transportation options, scheduling, and coordination of transportation options, the



Project

Timeline



location of activities, location of healthy food options, delivery options.

Access Measurables - Program and services enrollment numbers, program and services communication engagement (social media engagement, application analytics, communication reach). Public transit capacity and utilization (seats available, usage). Greenhouse Food Box delivered/picked up.

Access Targets - Increase in program and services enrollment, increase in public awareness of Akwesasne programs and services, increase public transportation capacity, increase in public transportation usage, increase in the number of locations for healthy food options, increase in healthy food options used.

Key Performance Indicator #2: Participation

The Participation KPI is defined as the number of community members and at-risk individuals making use of public programs, services and completing app challenges. This includes the number of people attending public programs and services and the number of people completing in-app challenges.

Why does Participation matter?

Participation levels indicate the uptake of these programs, services, and app challenge uptake, and are a precursor to them having positive effects. Tracking will inform future programming by indicating that oversubscribed programs should be scaled, and less popular ones should be

re-examined. Initial participation levels for community activity will establish a baseline, so that modifications can be shown to improve or reduce participation levels.

What affects Participation levels? Location of opportunity, distance, accessibility, weather, quality of offering, ties to Akwesasne heritage, the motivation of the individual, awareness of opportunity.

What can we control about Participation levels? Access to transportation, the location of opportunity, cost, awareness, motivation, quality, association with Akwesasne heritage.

Participation Measurables - Number of attendees for programs and services, number of completed in-app challenges, feedback on the experience.

Participation Targets - Increase participation number for programs, services and app challenges. Increase participation numbers in targeted age groups: youth, family, and senior.

Key Performance Indicator #3: Screenings

The Screenings KPI is defined as the number of CANRisk surveys completed by undiagnosed community members. This includes both CANRisk surveys completed in-person, and through the Akwesasne Community Application.

Why does Screening matter? Early intervention in diabetes risk factors can prevent long-term illness; broader



Application & Dashboard

MILESTONES	ZU	DELIVERABLE
Phase 1: Validation Stage	<ul style="list-style-type: none"> • Project Discovery • Project Kickoff & Planning • Feature Prioritization • Technical Discovery 	<ul style="list-style-type: none"> • Presentation on approach and plan.
Phase 2: Design	<ul style="list-style-type: none"> • Brand Sprint • Finalization of Branding • Production Design • Task & Work Flow Design • Development Consultation 	<ul style="list-style-type: none"> • Summary Report and Style Guide from Brand Sprint • Design Strategy Report • Sitemap diagram outlining project architecture.
Phase 3: Application Development	<ul style="list-style-type: none"> • Development Setup • Core Workflow & Functionality Development • Development of Key Screens • Feature Development 	<ul style="list-style-type: none"> • Application page templates • Application building completed • Testing, Quality Assurance, and Revisions Completed
Phase 4: Dashboard Development	<ul style="list-style-type: none"> • Development Setup • Core Workflow & Functionality Development • Data Collection and Parsing • Chart Styling 	<ul style="list-style-type: none"> • Dashboard building completed • Integration with application completed • Testing, Quality Assurance, and Revisions Completed

Smart Greenhouse Implementation

MILESTONES	MCA TASKS	DELIVERABLE
Phase 1: Project Planning	<ul style="list-style-type: none"> • Environmental Impact Assessment • Resource and Location Planning 	<ul style="list-style-type: none"> • Environmental Impact Assessment Document
Phase 2: Curriculum Development	<ul style="list-style-type: none"> • Hiring of Specialist • Collaboration with AMBE 	<ul style="list-style-type: none"> • Curriculum Implementation Plan & Rollout
Phase 3: Request for Proposal and Vendor Selection	<ul style="list-style-type: none"> • RFP Development, Analysis, and Selection 	<ul style="list-style-type: none"> • Selection of successful vendor.
Phase 4: Implementation	<ul style="list-style-type: none"> • Overseeing and management of vendor implementation • Integration with application 	<ul style="list-style-type: none"> • Greenhouse Implementation Completed



Electric Public Transportation System

MILESTONES	MCA TASKS	DELIVERABLE
Phase 1: Project Planning	<ul style="list-style-type: none"> • Resource and Project Planning • Vehicle research and selection 	<ul style="list-style-type: none"> • Environmental Impact Assessment Document
Phase 2: Request for Proposal and Vendor Selection	<ul style="list-style-type: none"> • RFP Development, Analysis, and Selection 	<ul style="list-style-type: none"> • Selection of successful vendor
Phase 3: Pilot Implementation	<ul style="list-style-type: none"> • Purchasing and Implementation of 1 Electric Car / District. • Integration with application • Evaluation of pilot project success 	<ul style="list-style-type: none"> • Determine next steps based on pilot evaluation

community CANRisk screening results establish a baseline from which our challenge can measure its overall effectiveness; a CANRisk baseline allows comparison of community rates to national standards; a CANRisk baseline provides a clear picture of those at-risk in Akwesasne.

What affects Screening participation rates? Education about diabetes and health risks; awareness of what the survey results mean; public perception, access to survey.

What can we control about Screening participation rates? Increase the availability of survey; increase education and awareness of what individuals should do given the results of their survey; facilitating streaming of at-risk individuals to clinics for preparation of personal plans for diabetes prevention.

Screening Measurables - Number of CANRisk surveys completed; the number of individuals recommended to health professionals.

Screening Targets - Increase in the number of CANRisk survey completions; increase streaming of at-risk individuals to clinics for personal prevention plans.



Payment Schedules

WEBSYSTEM PAYMENT SCHEDULE	DATE	AMOUNT
Phase 1: Validation Stage	July 1, 2019	\$212,212.50 + tax
Phase 2: Design	September 1, 2019	\$319,050.00 + tax
Phase 3: Application Development	January 1, 2020	\$578,925.00 + tax
Phase 4: Dashboard Development	July 1, 2020	\$295,950.00 + tax

SMART GREENHOUSE PAYMENT SCHEDULE	DATE	AMOUNT
Phase 1: Greenhouse Engineering, Resource Planning and Design & Curriculum Development	July 1, 2019	\$590,000.00 + tax
Phase 2: Tsi Snaihne School Community Outreach Greenhouse Implementation	April 1st, 2021	\$500,000.00 + tax
Phase 3: Kana:takon School Greenhouse Implementation	July 1, 2020	\$350,000.00 + tax
Phase 4: Ahkwesahsne Mohawk School Greenhouse Implementation	October 1st, 2021	\$350,000.00 + tax

ELECTRIC PUBLIC TRANSPORTATION PAYMENT SCHEDULE	DATE	AMOUNT
Phase 1: Project, Resource & Location Planning	June 1, 2019	\$150,000.00 + tax
Phase 2: Piloting and Evaluation of Smart Taxi and Electric Bus Implementation	November 1, 2020	\$535,000.00 + tax
Phase 3: Extended Implementation	October 1st, 2021	\$480,000.00 + tax

** Project Coordinator and Project Assistant Coordinator are allocated throughout the Smart Greenhouse Payment and Electric Public Transportation Schedules.*



Project Management

HUMAN RESOURCES

The Smart Cities project will provide many benefits towards new skill development, as well as full and part time labour opportunities. Part of the value of these employment opportunities will be knowing that the work directly benefits our community and has the higher purpose of improving health outcomes and quality of life at Akwesasne. There are many specific roles to fill, which we are confident we can recruit — or train and recruit — from our own community.

- For overall project oversight, A Project Manager position and an Assistant Project Manager will be secured to oversee the components of the Akwesasne Smart Cities project.
- To prepare the team for the Smart Greenhouse System, Economic Development will organize and familiate an agritech course so that the community will have a trained workforce from which to choose the actual employee team for the greenhouse implementations.
- Electric Public Transportation System drivers for the three small electrical vehicle programs — the Smart Taxi Service, the Smart Health & Social

Programs Delivery, and Food Delivery Services (all for people), as well as drivers for them — will be secured through a job opportunities program drawing from our local employment resources. This will provide our programs with a pool of applicants from which we can select the best team members.

- To facilitate our community member end-users' use of the new technology, we will recruit Akwesasne high school students who will be put to work through a Best Matches program within our community centers in order to offer assistance to the elderly and other technology challenged community members. Here the young will mentor those who would like to learn how to better utilize their smartphones so as to make full use of the Akwesasne Community Application System, and all its various capabilities.
- In addition, our Mohawk Council of Akwesasne Information Services technical team will be trained by our technology partners (zu) to support the technical requirements of the Community Application System Administrative functionality, which is to be housed within our territory. This is



the back-end to the mobile Akwesasne Community Application System and is responsible for organizing and supplying the mobile app with much of the information it presents. The training will ensure the Akwesasne Information Services technical team can maintain and administer the system, publish to it, update the app with information, news, educational elements, food inventories, maintain interactions with third party payment systems, make use of the information it aggregates, and so forth.

- **Electric Public Transportation System under-use may impact its viability**

As the planned Electric Public Transportation System – consisting of the Smart Taxi Service, the Smart Health & Social Programs Delivery, the Smart Delivery Service and Electric Bus Services – is planned to collect minimal fees, there is a risk to the financial viability if there is underutilization of the capacity. This could create an unsupportable cost burden. While there is a possibility that the smart taxi service may not be utilized, this risk seems rather small given the enthusiastic reactions noted at the community engagements. All have been strongly supported with “Can’t wait!” attitudes toward a local taxi service at affordable rates.

- Mitigating the case of low ridership for the electric vehicles, a fall back deployment is that the bus will still be utilized for the planned weekly runs our college students make to the Iohahiio facility.

- Mitigating the case the case that the smart taxi and delivery services are not utilized, these vehicles will be re-allocated for use with the health and social programs.

- **Greenhouses in particular locations are underutilized**

The activities associated with management of the greenhouses in the Smart Greenhouse System will be incorporated into the Akwesasne student curriculum. A greenhouse will be located at the Akwesasne Mohawk School with the purpose of learning and food production. If this greenhouse is not used to minimum required levels the AMS School’s greenhouse there is a risk to the viability of the greenhouse system.

- Mitigating the case of underutilization of the AMS school greenhouse container, that unit will be moved to closer to the Environments Offices and utilized within the agriculture sector for food production. Alternately, it can be relocated to the Iohahiio Education facility and be utilized for future adult courses on Innovative Growing Techniques.

- This risk is highly un-anticipated as all greenhouses will be worked into the curriculum of the school.



Procurement, including alignment with technology and partnership requirements

MOHAWK COUNCIL OF AKWESASNE PROCUREMENT STRATEGY

Our procurement strategy prescribes that when making purchases our council reaches out to at least three vendors through an RFP Process. For this purpose a purchase team is formed generally involving a finance department representative, a project manager and a manager representing the department impacted by the proposed purchase. This team then oversees the RFP process and reviews the incoming responses.

The Purchase of the Electric Bus for the Electric Public Transportation System will be administered through the Mohawk Council's Department of Community and Social Services along with the Board of Education's Transportation Supervisor. This person is key to the team as all further bus maintenance and bus scheduling decisions will be the responsibility of the transportation supervisor's position.

The intention of the Smart Taxi Service, the Smart Health & Social Programs Delivery, and the Smart Delivery Service is to create increased access of our social clients to have the means to obtain healthier foods, as well as to transport community members to medical appointments. ("Social clients" are individuals getting assistance from Community and Social Services.) These vehicle purchases and services, as well as the Smart Taxi Service Pilot Project will be organized through a team consisting

of the Smart Akwesasne Team and the Social and Health Departments.

The Smart Greenhouses system purchases will be reviewed by a team comprised of the Akwesasne Mohawk Board of Education, and representatives from the Department of Tehotienawakon Economic Development program.

And, the most important precursors to desired change may not be what we are originally focusing on so our analysis of impact and influence should be somewhat adaptable.

Stakeholders, including analysis of impact and influence

ANALYZING IMPACT OF PROGRAMS

For each of our Smart Cities project initiative categories, we will put in place oversight teams best representing stakeholders of the area we wish to affect. These stakeholder teams will assist in the identification of success and performance factors, as well as contribute to the ongoing adaptation of measurements to best represent goals and progress attainment. Too many measurements, for instance, will likely be distracting from the most important factors. And, the most important precursors to desired change may not be what we are originally focusing on so our analysis of impact and influence should be somewhat adaptable.

For each of our Smart Cities project initiative categories, we will put in place



oversight teams best representing stakeholders of the area we wish to affect. These stakeholder teams will assist in the identification of success and performance factors, as well as contribute to the ongoing adaptation of measurements to best represent goals and progress attainment. Too many measurements, for instance, will likely be distracting from the most important factors. And, the most important precursors to desired change may not be what we are originally focusing on so our analysis of impact and influence should be somewhat adaptable.

AKWESASNE COMMUNITY APPLICATION SYSTEM

A key stakeholder — especially in relation to the central challenge regarding the prevalence of new cases of diabetes — is the Mohawk Council of Akwesasne Health Department. This department will be instrumental in delineating the types of data most important to measure to both be effective in affecting the health precursors associated with our Smart cities Challenge, but also for tweaking our approaches to increase the program's effectiveness over the longer run. Targets of change may shift focus with the maturity of our program. For instance, initial goals may be about engagement and usage rates, which later give way to focus on improving service delivery and costs, which give way to focus on renewal and expansion of educational components, cultural curriculums and even recipes. So measurement must be flexible to take into account learnings and overall maturation of the program.

A stakeholder in all data collection, especially that flowing through the Community Application and Community Application Administrative system, is the Akwesasne Information Services technical team. This team is key to the always necessary step of information aggregation, organization and preparation for analysis by the more specific department stakeholder. The Technical Team will be included for both their technical support and technical knowledge. They will help clarify other team members understanding of the information, and so positively influence decision outcomes.

The Mohawk Council of Akwesasne Health Department will be primary users of the statistics and interpretation of data directly affecting health measurements and behaviours affecting health outcomes. For instance, screening numbers, service engagement and usage numbers, activity levels, food distribution measures, attendance to health services, missed appointments and so forth.

The Mohawk Council of Akwesasne Social Services Department will be keenly interested in the performance of the Electric Public Transportation System. These statistics are key to success factors in their area of responsibility. Central is the measure of (ideally) increasing transportation usage, which when higher is strongly suspected to better the quality of the lives of the social clients.

Our Smart Akwesasne Team and the Mohawk Council of Akwesasne Health Department will be eager for statistics the



system produces regarding healthy food delivery, number of users obtaining rides to grocery stores and medical destinations, and increases in trip numbers for personal health care evaluations or screenings. Devising methods to capture behaviours of their individual clients in accessing and making use of transportation to increase wellness is tricky. Defining the base case is also challenging as the base case for the new situation does not currently exist. Therefore, much of the initial information will be used to establish a base case from which these departments will try to build performance.

The Akwesasne Mohawk Board of Education, Department of Tehotienawakon, including the Economic Development and Environment Program will all be paying close attention to the performance of the Smart Greenhouse system. This has an educational component and associated measures of success, as students are both involved in staffing a greenhouse, but also in engaging in learning their operation, and so graduating from the course. Economic Development is seeking to create economic value from the Smart Greenhouses, in the way of jobs, job skill development, food production and food cost savings. Economic Development will also be following the measures around the development of job skills and expansion of roles in technical areas to do with the Akwesasne Community Application and Administrative Web System, as there are many associated skills to do with populating the system with information, writing, video production for traditional

cultural teaching dissemination, mentoring new users of mobile tech, system programming and maintenance, social tool use and many additional skills associated with maintaining the vitality Internet based systems. Economic Development may also monitor the economic impacts of new services from both a cost and revenue outlook, as well as on the value of keeping money associated with transportation in the community, rather than that money flowing to external transportation options. The Environment Division will be able to calculate the savings in CO2 production enabled by the switch of thousands of travel miles to electric from gas powered vehicles.

Communications strategies for community involvement, training, and feedback

Following the Design Thinking processes that have gotten us this far, we are eager to continue regular community engagements through quick surveys to gain feedback and ideas, so that we can continue to improve the system. With the core of the system based on the Akwesasne Community Application, which is a mobile hub in each community member's pocket, we have an immediate tool through which we can share information, news, questions, and new capabilities.

This is highly advantageous to the rapid evolution of our services. We can both listen directly to feedback and observe behaviour. Through questionnaires, polls,



message boards and so forth, and we can observe behaviour, measure usage stats and so gain objective data. This may be an important balance as requests for feedback are likely to be weighted towards the opinions of more active or prolific online personalities in the community, with the new users less comfortable with writing essays on their new smartphone.

Additionally, because the Akwesasne Community Application is Internet-based, additional functionality to do with surveying, for example, is only a click away. There is no value to creating our own functionality in most cases, such as for polling — that is already available for free or very low cost online. We will simply use our in app capabilities to post updates that link to surveys, or to video resources, third party educational elements and so forth.

We expect that to best increase engagement with the new Smart City tools of our diverse end users, especially with social clients, that this may best be undertaken in a combination session of in-person instruction with also the online system in hand. Education sessions and review sessions are likely to occur in this way for clients involved in the services of specific departments, to learn how this department's services are now offered via the app. For example, our social clients can be introduced to Smart Taxi, Electric Bus pickup request, and so forth —when they are meeting with case managers. Groups feeling a need for the extra nudge of in-person training can also attend organized evening community engagement sessions, where everyone brings their phone and

learns about a newly released function.

Monitoring, controlling and reporting strategies and checkpoints for contingencies and course corrections, if necessary

Following the Design Thinking approach, we will use the app to gather reviews on components, experiences with the services, ideas for improvement, and suggestions on how to make things more efficient. While Design Thinking helps with direction, we use the Agile Method for digital product delivery. The idea with Agile is that via frequent meetings with the client, (the Akwesasne Smart Team) progress on the functionality is reviewed and tweaked very regularly, as the application moves from minimum viable product to fully featured one. This emphasizes actual experience with the tool over documentation, and is proven as the best way to deliver software products. The whole approach is about course correction, about feedback from users.

This also provides a built in approach to managing scope while optimizing end result. We've used Design Thinking to collaborate with our community to get a very strong idea of what we need; BUT, until it is in the user's hands, and they are standing and waiting for pick-up from an Electric Bus, we can expect unforeseen problems to crop up, or cool new ideas for enhancement to emerge. It may be that, at this early stage of testing, that a scheduling



idea for the Electric Bus is decided to be more important than some already planned feature of the Smart Greenhouse ordering, and since the greenhouse will not reach full production for another year that programming resources will be used by diverting them to the bus scheduling enhancement. So the scope is rebalanced in collaborative agreement between us and zu. Our Project Manager and their Product Owner notes this change of resource use and we move promptly on with development, without the overhead of massive documentation and change orders. When you are inventing new things this is the way to be. (If we are ordering a new community centre and it already has a complete blueprint, then the more formal change order approach is necessary.)

In regards to the purchasing of electric vehicles and greenhouses, a more detailed process of estimates, associated charges and fees, delivery and set-up, even total cost of ownership will be adhered to. Traditional cost controls are more appropriate to capital purchases. Purchasing bespoke software must also fit timelines and deliver certain features, it's just that what's in the final product will be impacted by ideas, epiphanies, and feedback and should be encouraged. Like a cook tasting their cooking along the way.

That being said, zu is well practiced in building digital products and services, including monitoring burn rates and being totally transparent with their clients as their software development project progresses. With their total team recording to time sheets, tracking progress in Jira, tracking

our requests in Zendesk, all bolstered by regular weekly meetings with our Project Manager, and not even including the ongoing email, messaging and phone calls between our PM and their PO, there is little room for things to go off the rails without being immediately noticed. More formal reports are generated with every meeting and supplied to Smart Coordinator for review and action when required.

Weekly reviews of zu's Replicon time tracking system, where tasks are assigned a budget aligned to the statement of work, provides our Product Owner with real-time visibility on project health, task churn and slow down caused by blockers or delays. This information is then documented in the weekly Project Status Report provided from zu to MCA and any necessary steps to remove blockers or flag risks are discussed in weekly production meetings with the us.

There is a sweet spot between rigid timelines and development targets, and the serendipity of discovering new methods or better functionality changed by user testing along the way. zu explains they are well practiced at respecting the organizational necessity of steady progress towards agreed upon projects with the idea that we are in fact inventing the future, and the path towards invention may have a few unexpected twists and turns. Through our Production Road Map, several stage gates are implemented as a monitoring and course corrections strategy. Stage Gates are a project management technique in which an initiative or project is divided into distinct stages or phases, separated by decision points. At each of these phases,



we will revisit scope, timeline, and budget, making any appropriate adaptations where necessary.

Approach to sustaining projects beyond the lifecycle of the challenge, if appropriate

Our vendor partners will be resources to assist us in our plans to gain a maximum lifespan from our Smart Cities Project. While we intend to be self-sufficient in the longer-term continuation of the Smart Cities systems, we also recognize that there is a need to renew and adapt the system with more modern versions of itself. At the very least there will be ongoing maintenance and enhancement of systems, with which the original vendors are expert, and can assist us in becoming expert, as well. This necessity to keep working to improve the system is to both preserve the functionality of things as they will be at the end of the first phase, but also to adapt to new technologies of our modern environment, and to take advantage of the emerging technologies, as we are doing at this point in time.

The Akwesasne Community Application (Mobile and Administrative) will be

supported and maintained by the Mohawk Council of Akwesasne Information Services Program. zu may be called upon for more ambitious functional additions from time to time, though this is not currently part of the scope of the plan.

Smart Greenhouses will be sustained in conjunction with the Akwesasne Mohawk Board of Education (AMBE) and the Department of Tehotienawakon Environment Program, for the Akwesasne Mohawk School (AMS) and Tsisnaihne schools. The AMBE, Tehotienawakon Economic Development Programs will jointly utilize and maintain the St. Regis Smart Greenhouse location as it will be used for the school and as a special needs work experience location. We anticipate that this location has the potential to provide economic contribution to sustain the special needs program.

The Electric Bus will be fully sustainable through the budget of the Social Services Department. The Electric Bus expenditure simply represents a redeployment of a portion of an existing budget already dedicated to assisting their clients with transportation.



Technology

DETAILS ABOUT THE TECHNOLOGIES INCLUDING RELEVANT APPLICATIONS ELSEWHERE AND RESULTS OF TESTING AND/OR PILOTING IN THE FINALIST PHASE.

In looking at the iPhone as a breakthrough event, it wasn't so much about inventing any of the capabilities it provided as it was wrapping them into one package. Similarly, our Smart Cities Challenge project is about combining the capabilities we know will address our Challenge into an integrated mobile system.

Our Digital Ecosystem encompasses both the Akwesasne Community Application, as well as the infrastructure elements of our plan. Included are native mobile application and web application development, multiple greenhouse implementations, and Akwesasne's first ever public transportation system. Greenhouses and a Smart Taxi service may not be viewed as groundbreaking or emerging technology, but to the Akwesasne community, they most definitely are. Our solution reflects the true needs of the community and will create improved health outcomes, new ways to address our challenges, and opportunities to develop expertise with new technology all through coordinated improvements in infrastructure, information, and accessibility. Akwesasne services will be enhanced with the support and integration of our mobile and web applications, both

in what community members receive and in the ability of our public service workers to deliver them. Below we break down the details of the technologies involved, including examining relevant applications used in other jurisdictions, a look at case studies our partner zu has successfully completed and some of the results of testing carried out in this finalist phase.

Mobile application development is the set of processes and procedures involved in writing software for small, wireless computing devices such as smartphones or tablets. Each day thousands of mobile apps are published to the Google Play and Apple App Stores. Some of these mobile apps are games, others are social networks, and many are e-commerce apps. All of these apps, if professionally built, follow a similar mobile app development process.



Dating back to the early adoption of responsive web design in 2011/2012, our partners, zu, have accumulated extensive experience developing responsive mobile websites and native applications, including the use of front-end frameworks such as Bootstrap and Foundation, as well as custom implementations using CSS3, CSS Grid, and Flexbox. zu's team has developed native iOS applications targeting phones and tablets going back to 2009/10 and iOS version 4. This includes both line-of-business applications based on standard UIKit components, along with richer experiences involving animation and physics frameworks such as Box2D and SpriteKit. They have continued to build responsive and native mobile projects since the availability of these devices and their tech stack continues to evolve.

zu develops widely-used native Android applications targeting phones and tablets for high profile clients, with projects dating back to version 4.0 in 2012. They develop for the core Android framework as well as with Google's trusted third party community partner libraries such as Retrofit, OkHttp, and Glide. zu's team has mature knowledge surrounding automated testing strategies for Android including both unit testing and instrumented testing user workflow. This past winter, a zu designer was selected as one of only 20 people worldwide to participate in a prestigious Android design workshop hosted by the Android Development team at the Google offices in San Francisco.

zu employs various modes of automated software testing. zu says: "We frequently

unit test our application code with language-specific test frameworks, as well as develop functional tests using tools such as Selenium, WebDriver, Nightwatch.js, and others. We load test our applications using open source tools such as Apache Bench, Siege, and various cloud-based tools."

zu as Digital Partners

zu is an ideal partner for Akwesasne's Smart Cities solution because they offer skills in determining right direction, they have capabilities to build digital products that are required for the vision and they will provide long-term stewardship for the digital systems they have built. They also provide Design Thinking expertise which zu uses to design non-digital process and components, which is a proven method for creating things that will be well received by end users, as they are so much a part of the process of their development.

Here is a sample of the types of major projects and transformational work zu has accomplished in the past 24 years of their existence.

MOBILE AND MOBILE/DESKTOP PLATFORMS

From the development of the TimmyMe iOS App for Tim Hortons' in 2008 on the iPhone, which made sense with the advent of geo-location services, through the years of Blackberry development and its fall from favour. Now into Android development, as well as mobile responsive (or simply 'responsive') design, zu moves into the latest technology. But they always program



for the purpose, not just to use a new technology. Currently, zu uses strong skills in iOS, Android and responsive web design to produce and maintain products for a variety of clients. Some projects of note include:

MYSASK 411 PLATFORM

Rebuilding Mysask411 Mobile and Desktop systems from the core
(Term: 2013- Present)

Directwest built a 100-year legacy on connecting Saskatchewan buyers and sellers. The phonebook they produced served as the principal source for customers seeking and connecting with local businesses. As times changed, Directwest modernized its business offerings with a suite of digital products and services intended to keep pace with global technological innovation. Along with traditional industries around the world, however, Mysask411's user experience came up against disruptive digital headwinds and competition. The web and mobile versions of the Mysask411 platform struggled to perform on modern devices and needed to be rebuilt. Speed and performance were major issues. The web version and mobile applications had to address both mounting technical debt and a dated user experience.

The Mysask411 platform needed a renewed user experience, informed by users and built to last and adapt. zu was brought onto the project in August of 2013, and has since completed dozens of projects of large and smaller scale to improve the functionality and effectiveness of the suite of services

the Mysask411 offers. In addition, zu uses Design Thinking with both DirectWest senior management teams and product teams to identify opportunities for service expansion, which are collected in project backlogs. These are then evaluated and developed on a priority ranking. zu is firmly part of the DirectWest team serving as a digital strategist, developer and long term optimizer of the suite of applications.

HELP ME TELL MY STORY / HELP ME TALK ABOUT MATH

Education Assessment System and iOS application (Term: March 31st 2016 - March 31st, 2019)

The Help Me Tell My Story education platform is another major achievement as an iOS and web system development that also incorporates Indigenous culture. The combination of technologies is similar to what will be deployed for Akwesasne. It has many levels of administrative access and collects data while optimizing the mobile user experience for the end users, who are children.

The Help Me Tell My Story assessment, which takes place by the children interacting with amusing gamified tasks, uses a holistic approach to measure oral language development for Prekindergarten and Kindergarten children. The Help Me Talk About Math application similarly uses a holistic approach to assessment to evaluate grade one students' understanding of seven mathematical processes: communication, making connections, mental mathematics and estimation, problem-solving, reasoning,



and visualization. Both collect data from the children, their caregivers, their teachers, and Elders in their community and provide immediate access to results for educators and caregivers through easy-to-use web-based tools. The overall purpose of these assessment is to help create a real and measurable change in oral language development and real and measurable change in the mathematical process development of children across Saskatchewan.

Both these systems are extensible for other curriculums and are being extended to have French language versions. The systems have also been made available to other jurisdictions — as is intended with the Akwesasne Community Application — and the general public via the Apple App Store, though without the administrative functionality. zu continues to be a transformative digital partner for the Government of Saskatchewan, Ministry of Education.

Other Notable zu Applications

Here is a brief list of other projects requiring mobile application/web application combinations, as will be required for the Akwesasne project.

TIM HORTONS

TimmyMe iOS Application

When it was first launched, TimmyMe quickly became the top downloaded free iPhone app in Canada and Tim Hortons took notice. With over two million users, the app featured GPS to direct folks to the

nearest Tim's drive-thru and included a notepad for taking orders from your co-workers.

SASKATCHEWAN ROUGHRIDERS

iOS Application

zu's created various digital solutions for Saskatchewan's favorite CFL team. In partnership with SaskTel, they took the Roughriders mobile with iPhone and Android apps that deliver schedules, standings, player profiles and stats, news, Twitter integration, videos, live radio streaming, shopping in the RiderStore and more. Rider Nation responded with over 100K downloads in the first year and over 3M sessions, leading to a 52% increase in orders and a 40% increase in customers.

MACKENZIE ART GALLERY

iOS Application

Mackenzie wanted to be a gallery for the 21st century, so zu was brought in to devise ways to use mobile technology as a catalyst for generating discussion, driving foot traffic, and connecting people to art like never before. Now their app is as much a part of the gallery experience as the physical gallery, helping people discover and engage with new exhibits and the permanent collection.

VITERRA MOBILE

Application Android and iOS

Buying and selling of crops require accurate information, and farmers may need that data while literally standing in the middle of a field. Going beyond providing up-to-date commodity prices offered at terminals, zu also created a



nitrogen calculator so that farmers could work out their fertilizer needs on the fly. Users can change criteria, toggle results and, ultimately, make informed decisions. Viterra, like the farmers, understood how technology helps people work efficiently and effectively. This responsive website and web app, drawing on Viterra back-end systems for data feeds, experienced 434% first-year growth, representing 25,000 total hrs spent in the app in 1st year with half of all users accessing the app daily, and one-third spending 1-3 mins per session. The zu team was delighted to help them engage with the global farming community.

Approach to future-proofing the technologies (i.e safeguards against vendor-generated proprietary constraints and obsolescence, a workforce that is able to implement and operate the technologies and systems going forward.

Ensuring high quality and extensive customizability, the Akwesasne Community Application will be built as a Native mobile-web application. Native apps are built for specific platforms (iPhone, Android) and are written in the languages the platform accepts (for example, Swift and Objective-C for iOS apps and Java or Kotlin for native Android apps). Native apps are fast and responsive, distributed in app stores, offer intuitive user input and output and don't require an internet connection. In addition, native code is non-proprietary, has an army of developers at our disposal, and is free to use.

Though this is not a frequent occurrence for zu, transition of projects to alternative service providers does happen, and zu is ready by design and choice of frameworks to not have proprietary blockers preventing other suppliers from being able to take over custodianship of the systems they've built. Recent examples of projects being transferred away from zu include the planned-from-the-start repatriation of the Drupal-based City of Saskatoon websystem; and the repatriation of the PotashCorp websystem – after nearly 20 years of internal zu management – to the new Nutrien management team. (In both these cases, the relationship continues with zu being invited to contribute to new initiatives). In all cases of project repatriation, a transition plan is developed in consultation with the client on how to best setup the environments necessary for maintaining system health long-term and to provide the client team with strategies to maintain and optimize the system.

System longevity

Achieving long-term value from any digital asset requires a commitment to supporting the software development lifecycle. The increasingly rapid pace at which mobile and web technology evolves, and best practices, online threats and user expectations change make it hard to keep up. zu's support and optimization model is designed to keep the Akwesasne team aware of issues affecting application health and security. They will also keep us on track regarding opportunities for iterative



enhancements and to take advantage of new trends or technologies, as they do with their other long-term clients.

ZU SUPPORT AND ENHANCEMENT SERVICES INCLUDE:

Support: Emphasizing continual testing and proactive analysis of known security threats and asset risks.

Optimization: Focusing on keeping pace with modern devices, browsers and operating systems impacting the performance of the platform for users.

Continual support and optimization go hand-in-hand to ensure our digital assets' long-term viability is maintained. zu's technical expertise and development processes make future adaptations such as API development, continued system integrations and reengineering cost-effective and made with ease. Services include:

- Monthly browser, OS and device testing
- Host environment performance measurement
- Optimization backlog development
- Major risk assessment and resolution
- Quarterly reporting
- Continued system integration
- API creation
- Design heuristics review
- Digital brand alignment

zu understands that the development of web-based tools and mobile applications can leave companies feeling handcuffed in their ability to operate systems going

forward. Prior to completion of the Services, Akwesasne and zu will put in place an agreement zu for the maintenance and support of the Akwesasne Community Application; the agreement in Appendix A.

TECH EXPERIENCE OPPORTUNITIES FOR AKWESASNE MOHAWK FIRST NATION

Looking further into the future, this proposed digital eco-system will introduce the Akwesasne community to opportunities to take part in new technology in their community, both for those with existing expertise and those who hope to develop skills.

The Mohawk Council of Akwesasne works closely with the Ontario Emerging Jobs Institute (OEJI). OEJI is a unique offering that provides instruction from industry leaders and hands-on training for jobs of the future. Students train for the growing demand for skilled workers in areas identified as high need including topics such as web development, digital marketing, social media marketing, artificial intelligence, graphic design and search engine optimization. Currently, of the 160 students attending this program, 11 are from the Akwesasne First Nation.

The Mohawk Council of Akwesasne also currently has 15 personnel as a part of their Information Services team. This includes;

- 1 Manager
- 1 Program Support Officers
- 4 Network Analysts
- 4 Hardware Technicians
- 3 Software Analysts and
- 2 Help Desk Technicians



The team supports provides a range of IT services to all departments and programs within MCA including the Akwesasne Mohawk Board of Education. Information Services oversees the maintenance, repair, upgrade, etc. of more than 800 computers and 25 individual networks and one wide area network. The Software Analyst team supports 75 different specialized software, some of which are built programmed in house. We feel we have the technical and human capacity that is able to implement and operate the proposed technologies and systems going forward. There will be opportunities for zu to train our team to the extent we find appropriate, knowing that zu could remain as principal stewards of the systems, or as helpers, or could be completely replaced by the Akwesasne team, at our option.

How the technologies comply with relevant legislative and regulatory requirements

LEGISLATIVE REQUIREMENTS

In Canada, mobile applications are regulated under the Personal Information Protection and Electronic Documents Act (PIPEDA). The Act, enacted in 2000, governs how private organizations collect, use and disclose personal information. MCA and zu commit to comply with all applicable laws regarding the protection of personal information including PIPEDA. Please reference our Preliminary Privacy Impact Analysis for in depth analysis.

FLEXIBLE DEVELOPMENT STANDARDS

Our Smart Cities Solution currently presents limited interoperability between technologies such as existing community systems, services, and infrastructure. However, our partner zu is well-versed creating necessary interactions (such as have been necessary in their past projects with many types of interactions) and uses due diligence in all expected and potential integrations. A few instances of interoperability have been identified and will be explored in the next phase for development. These include:

- Requesting, Tracking and Paying for MCA's Smart Taxi service within the application
- Ordering, Delivering and Paying for Greenhouse produce, and the 'Green Food Box' within the application
- Integration and interoperability with third-party fitness and health tracking applications
- Future interoperability with Telus health.

RIDE HAILING SERVICES & SMART GREENHOUSE INTEROPERABILITY

When developing our public transportation system and integrating it with the application, there are three pieces of interoperability requiring third party software and frameworks. First off, like other ride hailing services, (ie. Uber, Lyft, Instacart), our app requires access to the CoreLocation framework. This allows individuals to both request rides and share location addresses with a driver



through geolocation, and order groceries to their specific location. This framework provides classes and protocols to configure and schedule location delivery and send location events to the server. The CoreLocation framework also lets our application define geographic regions and monitor a device's movements as it crosses defined boundaries. Secondly, to display point-to-point directions on a map within the app, iOS developers use a Framework called MapKit. Registering the app as a routing app then makes directions available to the Maps app and all other mapping software on a user's device. Android routes and directions, however, are made possible by the Google Maps Android API. Thirdly, to use a cashless system that allows credit and debit transactions and so remove all risk of human-to-human cash transfers — we will interoperate with one of two leading companies in the mobile payment market, Braintree or Stripe. Both payment frameworks are used by current, emerging and established companies and follow both the Code of Conduct for the Credit and Debit Card Industry in Canada, as well as PIPEDA.

FITNESS AND HEALTH APPLICATION INTEROPERABILITY

With health and fitness applications extremely prevalent today, understanding the interoperability of default and leading health applications will maximize the advantages of integration with them. To ensure the Akwesasne data is stored and managed exclusively under MCA Information Services we investigated the leading brands in health and data tracking.

We need to understand the complexities and privacy concerns of the applications we intend to use, such as Apple Health, Google Fit, and Samsung Health, as well as the wearables offered by Fitbit, Garmin, and Apple Watch. Google Fit was subsequently quickly dismissed due to the requirement that any app that reads Google Fit data must also store any collected health data with Google.

APPLE HEALTH

Apple Health provides operating system level storage for health/fitness data through a framework called HealthKit. Apple's intent is for 3rd party app developers to create apps that integrate with HealthKit to make "rich" fitness data available to both the Apple Health App and HealthKit. Any app can request permission to read/write a number of different types of health information based on a large list of "categories" provided by Apple. Once fitness information is stored in HealthKit, it's essentially available to any app that the user grants access to read from HealthKit. While the HealthKit framework appears somewhat complex, it's capable of surfacing any data recorded by the Health App, or any other "service" (tracker apps), both as granular data and aggregate statistic. This is all good news.

SAMSUNG HEALTH

Samsung smartphones come with the Samsung Health App (aka "S Health") pre-installed. The Samsung Health app is also freely available on the Google Play store for installation on non-Samsung devices. In many ways, Samsung Health is analogous



to Google Fit, but with two key distinctions. Any application that wishes to read/write/share data with Samsung Health must be approved as an official Samsung partner application. Unlike Google Fit, no Samsung account is required to use Samsung Health, though Samsung promotes the creation and use of an account to sync/backup data to Samsung's cloud service, and to make data available across multiple devices.

In conclusion, the health app ecosystem for Android is, unfortunately, more fragmented than iOS. There is no analog to HealthKit (operating system level storage) for Android, and it's up to individual apps to be responsible for the storage and sharing of health data.

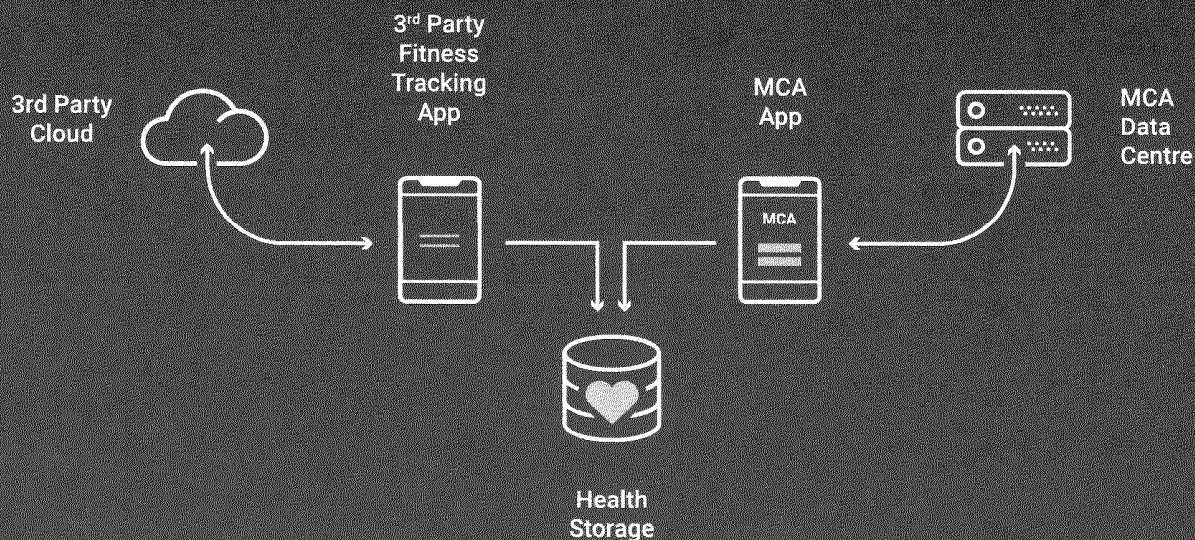
WEARABLES

- Fitbit does not directly integrate with Apple, Samsung, or Google health apps, though fitbit does allow access to data through a web-based API.
- Garmin provides a Garmin connect app for both platforms and so can sync data to any of the health apps discussed above.
- Apple Watch does not provide health tracking on its own. Rather, it relies on "WatchOS" extensions provided by applications installed on accompanying phones that can read and store biometrics to Apple Health.

With this background in mind, we plan to make use of Samsung Health (Android) and HealthKit (iOS) systems. We can then migrate the data users are currently tracking on their devices while maintaining

a familiar user experience for individuals comfortable with their current applications. Privacy concerns remain at the forefront of our build; as stated, MCA and zu commit to complying with all applicable laws regarding the protection of personal information such as that found in The Personal Information Protection and Electronic Documents Act. Privacy is also key to earning the trust of users, as their engagement and acceptance is also a key measurable for our initiative's success.





Fitness Data Sharing

TELUS HEALTH INTEROPERABILITY

The Mohawk Council of Akwesasne is in preliminary talks with Telus Health to implement their proprietary software throughout all Canadian jurisdictions. The opportunities and capabilities of this homegrown system is interesting but needs exploration. Further research and discovery will need to be completed during the strategy phase of implementation.

REPLICABILITY ACROSS CANADA

We suspect that the factors contributing to a higher prevalence of diabetes in the Akwesasne community hold true for all Indigenous communities across Canada.

If we succeed in having a real impact on health outcomes in Akwesasne through the areas of focus we have piloted, we will be open to having our approach and software replicated for use by other first nation communities. We are energized by the possibility of improving the health of other communities via our Smart Cities approach to targeting causative factors we suspect are consistent culprits. While the software may be directly applicable to other communities as it stands upon completion, some degree of customization will undoubtedly be necessary for its deployment, given the specifics of that second situation. Ideally, a consistent



core could be maintained so those future improvements could be rolled out amongst all future users.

ROLES AND RESPONSIBILITIES OF TECHNOLOGY PARTNERS

The role of zu in this project includes helping our team collaboratively identify the strategic direction, providing the design for products and services including the development/programming and support of the Akwesasne Community Application, and it's integrated systems. Within our governance structure, prior to selection of both the Greenhouse System & Electric Public Transportation System technology partners a public tender will be requested for both personnel and strategic implementation.

IDENTIFICATION OF RISKS (E.G PRIVACY ISSUES, CYBERSECURITY BREACHES) AND DEVELOPMENT OF APPROPRIATE MITIGATION STRATEGIES

No Internet technology is risk-free. However, as we intend to program to best practice standards, and follow the available standards for privacy, system security, data back-up and so forth, we will reduce risk to the acceptable baseline all Internet-based systems face. At this time there are no known risks in the implementation of technology particular to this project.

ACCESSIBILITY AND USABILITY OF THE TECHNOLOGIES TO DIVERSE USERS, RESIDENTS AND OTHER STAKEHOLDERS THAT SUPPORT THEIR UPTAKE AND ACCEPTANCE.

Web Content Accessibility Guidelines (WCAG) 2.0 and Authoring Tool

Accessibility Guidelines 2.0 covers a wide range of recommendations for making web content more accessible. Following these guidelines makes content accessible to a wider range of people with disabilities, including blindness and low vision, deafness and hearing loss, learning disabilities, cognitive limitations, limited movement, speech disabilities, photosensitivity and combinations of these. Following these guidelines will also often make your web content more usable in general. (<http://www.w3.org/TR/WCAG20/>)

Each page and feature will be developed with an understanding and incorporation of Web Content Accessibility. Some key elements of the guidelines include the 'Skip to Content' link which allows people to quickly access content by skipping primary and secondary navigation. A redeveloped application will also be screen reader enhanced optimizing the site for visibly impaired individuals. Appropriate contrast will need to be designed between links, text, images and any user interface elements on each page.

zu's team has relevant experience in developing websites and mobile platforms within these guidelines.. From these projects, zu has learned best practices that will be transferable to Directwest. Throughout development, zu will test the mobile platform to ensure that it is meeting level AA Web Content Accessibility. We will also be sure to use the Authoring Tool Accessibility Guidelines 2.0 for content created and migrated to MCA.



Governance

GOVERNANCE FRAMEWORKS AND STRATEGIES TO OVERSEE AND MANAGE PROJECTS, PROJECT RISKS, FINDS, AND PARTNERS THAT ARE RIGOROUS, TRANSPARENT, EFFECTIVE, AND PROVIDE VALUE FOR MONEY

Since the late 90's MCA has been in a Nation Building process, a process that allows for the investigation and negotiation of a draft Akwesasne Governance Agreement. The process was initially termed a Nation Building process and has since been renamed Entewatatháwi or "We Will Govern".

The overall goal of this process is to investigate the extent of Canada's commitment to negotiate a Self-Government Agreement specific to Akwesasne where MCA exercises jurisdiction. Entewatatháwi has been working towards establishing the laws, regulations, policies, practices, and institutions that will govern the northern territory of Akwesasne. The Road to Self-Governance Negotiation of a final agreement on Governance will provide clear formal recognition by Canada of Akwesasne's governance institutions and address the relationship of Akwesasne's and Canada's laws. Negotiations have also begun with Ontario and Quebec on some jurisdictional issues. Self-Governance is a long and grueling process that involves negotiations with the government of Canada, our own local governments and leaders, educating and consulting our

community and making sure we protect our inherent rights as Akwesasronon. Ultimately, it will be our community that determines whether or not to accept the negotiated Akwesasne Governance Agreement by holding a community referendum.

- Governance / Council Portfolio's include:
- Department of Technical Services
- Akwesasne Mohawk Board of Education
- Executive Services
- Department of Health
- Department of Housing
- Department of Justice
- Public Safety
- Department of Tehotiiennawakon
- Tehotiiennawakon - Environment Division



Mohawk Council of Akwesasne Carries out projects with at least three personnel involved, Manager, Assistant, and Technician. Project timelines are created with project management theories. Regular project meetings are held with key personnel involved, this includes outside contractors. Mohawk Councils Finance policy requires 3 quotes for anything purchased over 1000.00.

- Managers can sign off up to 5000.00.
- Directors sign up to 50,000.00 with mandatory RFP process.
- The Executive Director signs up to 100,000.00.
- Any Contracts, payments over 100,000.00 must be processed by a Mohawk Council Resolution(MCR). There are 13 chiefs on council and 7 are required to sign in agreement of a decision through the MCR Process.

In working with clientele, their partners and unique stakeholder groups over the years, we have some proven ideas on governance that can assist in our process as well. As a partnership we believe strongly in the benefit of open communication but recognize the need to focus the collaboration where possible. Before project kickoff, key client decision makers and approved deadlines will be revisited and finalized.

STRATEGY

Typically projects are built in phases with initial consulting and strategy leading to a deliverable such as a communications brief, information architecture, low-

fidelity concept sketches or an experience prototype in the form of wireframes or a mobile prototype for user testing. During this phase, the client's Project Coordinator (PM or Manager) will help coordinate meetings, demonstrations and communicate feedback and approvals at our Product Owner, who is the main point of contact from kickoff to launch. The client's Project Champion (Director level) will be available to provide insight during consultations and liaise with executive and board members who require visibility. An Executive Sponsor (Executive Member) or Committee is often involved early on to set direction with our team but will be consulted throughout the phase to ensure objectives are being met.

PRODUCTION DESIGN AND DEVELOPMENT

Once the direction is set, active production begins with weekly demonstrations of progress as outlined in the project timeline. The Project Coordinator and Project Champion will be required to attend these meetings to provide input and liaise with executive and board members who require visibility. An Executive Sponsor or Executive Committee will be consulted throughout production to ensure objectives are being met at key milestones outlined in the project timeline.

Deliverables will be submitted to the client's Project Coordinator for internal feedback. Any approvals or sign off will follow in weekly production meetings creating a feedback loop from the start of production design and into development. Once development demonstrations begin,



a Technical Lead (Client IT Group Member) will join the client's team to coordinate integrations, flag risks and provide materials and support to our developers if required.

Finally, active user acceptance testing will be performed within the feedback cycle and then again prior to launch. By the end of the project, end-to-end testing will be completed internally at zu and on the client side to reach final approval. Once the product is approved, the asset will go through predefined steps for launch as outlined in the project timeline.

ESCALATION

Throughout the entire process, from strategy to production and launch planning, any issues that require escalation beyond weekly project meetings will be addressed with the Account Manager by the client's manager/director representative. If unresolvable, issues will be escalated to the Executive Sponsor by the client's executive team member.

Details about the partners and their role, capacity and readiness

zu is our only major partner defined through the Smart Cities Challenge. They build digital products and services and uses a design strategy to drive innovation within organizations. Founded in Saskatoon in 1995, zu is a happy, motivated team of 35 confident in achieving success on every project and committed to working

with clients building modern solutions for mature industry problems. zu's team is a mix of Design Thinking experts, analysts, production designers, developers, IT and client support specialists focused on building tools that are informed by users and meet client business objectives. Their services are grouped to correspond with the lifecycle of digital products.

Collectively zu has the bench strength and the decades of experience to hit home runs on big, challenging projects. Our technical depth and our cosmopolitan appreciation for style and elegance are focused by our adherence to the user-centric approach to design. Our plans are therefore on target, our ability to execute proven and not easy to replicate, and the result for the MCA application and Smart Cities Challenge project will embody a balance between being uniquely engaging, practically sustainable and innovative. Our combination of youthful design, project sensibility and decades of programming experience, deployment and support means the best of all worlds for the Akwesasne web system, especially when it comes to creating something for today and for tomorrow.

RISK MANAGEMENT APPROACH

The goal of our risk management is to decrease the chance that we don't deliver working software to a happy client. We want our client to have participated in choices involving adding or chopping features and scope so that the most important features are accomplished on time and on budget.



To assist with managing risk throughout projects, zu utilizes a Project Status Report. This document allows MCA and zu to communicate and provide weekly project status updates during client demos. We can highlight milestones, design concepts or major features and flag them if there is an issue, or if everything is on target. This will also highlight past accomplishments, key activities for the next week and upcoming issues that should be addressed early. We can track all decisions that impact the project, along with a budget update.

Communication is critical for project success. Our approach is to maximize project visibility with clients and form a tight-knit relationship with our project leader, the Product Owner. We document these plans in a project charter before kickoff. This document acts as a reference for key decision makers on the production side and the client side. It includes key milestones and project objectives. Put into action, our Product Owner becomes our client's main point of contact for ongoing production and flagging any issues, risks or challenges as they come up.

The myth still exists that software and complex systems can be planned out like building a bridge. That Gantt charts and timelines and feature sets are predictive of project success. This is not so, and is proven in the terrible track record of software projects that have failed, even though all these risk-reducing factors were in place.

zu has long ago recognized the importance of the Agile method for software building that accepts lack of predictability and

instead focuses achieving project success by accomplishing important things first, by allowing the scope to be modified to make the most effective use of the constraints of time and money, to recognize dead-ends quickly and double down on good ideas that arise in the process of building. Transparency and approval for what is being done, what is done and what will be done are discussed in sprints with the client at regular and short intervals.

EVIDENCE AND DETAILS ABOUT THE PARTNERSHIPS, INCLUDING THEIR NATURE, TERMS, ACCOUNTABILITY STRUCTURE, AND FINANCIAL REQUIREMENTS.

On the 30th day of September 2018 The Mohawk Council of Akwesasne and zu.com communication Inc. entered into a contractual partnership between client and consultant. Please refer to the confidential annex for our Master Service Level Agreement and Memorandum of Understanding during the Finalist phase of the Smart Cities Challenge.

APPROACH TO PARTNERSHIPS THAT RETAINS COMMUNITY CONTROL OVER SENSITIVE AND PERSONAL DATA

Although zu is the contracted firm to build the technical aspects of the app/web portal, Mohawk Council will own the rights of the system and house and retain all data created with the system. All data collected, used, and disclosed will be managed under the Mohawk Council of Akwesasne stored on MCA internal data centers and servers. Please refer to our Preliminary Privacy Impact Assessment for an in-depth analysis of information privacy.



Engagement

APPROACH TO ENGAGING WITH, GAINING ACCEPTANCE FROM, AND ONBOARDING RESIDENTS AND OTHER STAKEHOLDERS FOR PROJECTS THAT ENSURE ONGOING ALIGNMENT BETWEEN THE OUTCOMES AND THEIR CONCERNS AND NEEDS.

In order to understand where we are going in the implementation phase, it is important to understand where we have been over the Finalist phase. As strong believers in human-centered design, and designing with users and for your users, we have put Community Engagement at the forefront of our Smart Cities Challenge solution.

Over the past several months, we facilitated workshops with inclusive user groups, interviewed internal and external stakeholders, hosted community engagement events, and surveyed and user tested our prototypes with Akwesasne community members. The 5 stage approach brought by Design Thinking was executed by our partners at zu through a series of trips to our community. We completed the recyclable model several times to come to the prototyping and feature prioritization of our Community Application, narrow in on our Smart Greenhouse concept from several implementation ideas, and understand the true needs of the community for the execution of our Electric Public Transportation System.

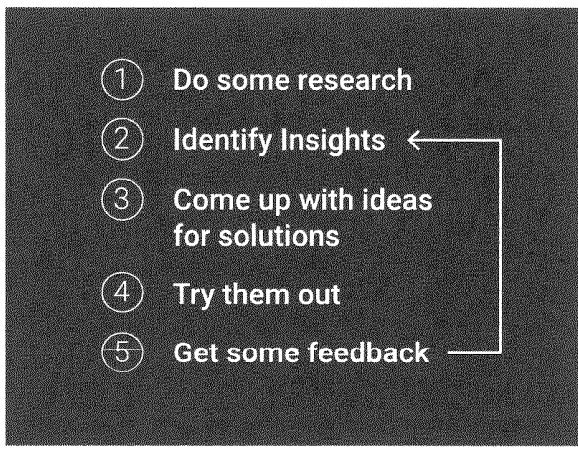
To ensure a substantial amount and quality of community engagement, we leveraged

the Design Thinking methodology and process, which is a **practical approach** to finding **creative solutions** to problems, inspired by traditional design methods, or more simply, an approach to problem-solving, which we will dig a bit deeper into and outline below.

“Thinking like a designer” means leveraging empathy, experimentation, and often technology, to produce solutions that help real people. Design Thinking is heavily rooted in Human-Centered Design, which emphasizes a user-first approach: finding out what users really need, then balancing solutions for those needs with the possibilities of technology, and requirements that define success for the business.

Several popular Design Thinking structures have emerged over the years. Most have the same basic underlying model:





A common Design Thinking structure

1. Do Some Research

Research is critical to Design Thinking. Gathering information about a problem helps define the problem (or more typically, problems), so we can determine what the right problem is to solve. Design thinking research takes the form of interviews, usability testing, surveys, looking at analytics, and so forth. And research never really stops as feedback goes back in the top and then becomes the subject of feedback once more.

To ensure we look at user needs from multiple angles, we follow four research themes.

About Them - Takes the form of indirect research about Akwesasne and our community members living here. We looked at existing internal data, industry and community reports, and aggregated data. This indirect research included:

- Akwesasne Satisfaction and Experience Surveys
- Akwesasne Cultural Orientation Guides

- Mohawk Council of Akwesasne Department of Health - Annual Reports
- Mohawk Council of Akwesasne -Healthy Eating and Active Living (HEAL) Program - Indicator Reports
- Mohawk Council of Akwesasne - Strategic Plan
- Mohawk Council of Akwesasne - Comprehensive Community Plan

With Them - The most common method of “with them” research – or “with Us” in this case – is a simple 30 to 45 minute 1:1 interview in person or on the phone with the interviewee. “With them” interviews were undertaken with our community members themselves and also with groups and individuals that regularly interact with community members. In the finalist stage of our work, our “With Them” research included interviews with many distinguished individuals including:

- Amber Montour
(Manager, Wholistic Health)
- Sarah Thompson (RN, Supervisor)
- Della Adams
(Traditional Medicine Employee)
- Lesley Bero (Program and Diabetes Prevention Manager)
- Karole Mitchell
(Community Health Nurse)
- Cindy Francis-Mitchell
(Assistant Director of Health)
- Andrew Francis (Data Health Management Coordinator)

During these interviews, we asked straight

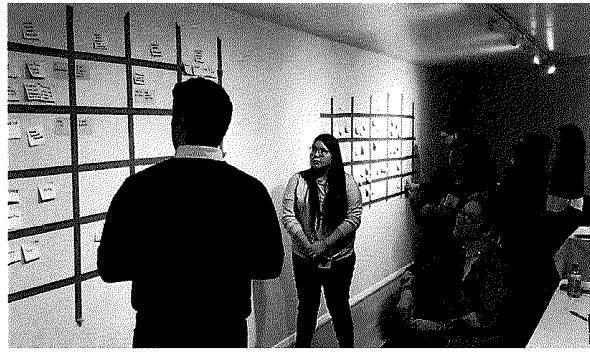


forward, open-ended questions to gather information and insight while leaving the interview loosely scripted. This allowed our interviewers to adapt their line of questioning and vary which answers received more detailed follow up questions. We ask, for instance, What do they know about the client? Where they see their clients struggle? What questions are clients asking? What can be done to make the user's experience better?

"Be them" - The "be them" method allows researchers to gain empathy for a user's pain points by walking through an entire journey exactly as they would experience it, from start to finish, in the most natural context possible. As a part of our research phase we had MCA employees take us through their diabetes journey. Each journey started with being screened for diabetes, to find out if they were free of symptoms, pre-diabetic, or diagnosed diabetic. Then it was understanding the implications of their assessment, and how they were to manage their life in each case for the long term. This led the research team to an understanding of their journey, all the user's actions, touch points, thoughts, and emotions experienced by the individual through the process, often including their family's experience with the individual's journey. In approaching any particular event or process as a journey, fewer possibly important elements will be missed. More details will be noted this way, when subjects are asked to tell a story exactly how they walked through it, rather than if people are simply asked to describe what they remember about an experience.

2. Identify Insights

Once we finished the research stage, we sought to extract meaning from it. Pulling insights out of our research, and choosing the really important ones is an incredibly valuable step in setting the stage for effective ideation. Many folks typically want to brainstorm on ideas without adding new nuggets of information to the conversation, and so get nowhere new.



Journey Mapping workshop with Akwesasne community members and stakeholders

But Design Thinking has us start with a load of information, and then provides methods to identify insights efficiently and collaboratively. These insights then feed the creation of really innovative ideas. In our workshops with MCA stakeholders we used the techniques of the practice, we group shared and affinity mapped to identify patterns and themes. We wrote and edited challenge statements to concentrate on the most important underlying challenges of diabetes.

Our preliminary research and stakeholder workshops led us to the following key insights.



A map of the Akwesasne region, showing the international border between Canada (top) and the United States (bottom). The map includes labels for various locations such as Cornwall, Ontario, Canada, and the Akwesasne Reservation. It also shows the St. Lawrence River, the Niagara River, and the Akwesasne Island. The map is titled 'Akwesasne 1:118,000'.

FOOD INACCESSIBILITY

NETWORK ACCESSIBILITY

insufficient mobile network capabilities. In all 3 districts, our community expresses frustration with so-called “dead zones” in many areas. This lack of contact creates barriers to our members receiving information regarding events, community activities, or communication for transport. Recognizing the value of our current efforts that made us a finalist of the Smart Cities Challenge, the Mohawk Council of Akwesasne has plans to leverage our efforts and take this as an opportune time to update Akwesasne’s mobile infrastructure. Using their own internal budgets, the Mohawk Council will actively support the development of the Smart Akwesasne solution by providing necessary infrastructure.

TRANSPORTATION ACCESSIBILITY

Lack of public transit, combined with the lack of personal vehicles for many, makes it extremely difficult for Akwesasne people to gain access to opportunities offered in our three principal communities. As spoken to above, the opportunities we are most concerned about for community members are accessibility to food, to health services, to fitness locations and activities, to community events, and to other social services. With the implementation of our Smart Cities solution we will create accessibility to these opportunities. With the Smart Cities project in place our people will enjoy the possibility and option of traveling between districts, and with minimal financial burden. Accessibility has been determined to be one of our key strategies to reduce new cases of diabetes in the community.



Ideation Workshop on 'How Might We' statements with Akwesasne community members

WESTERNIZATION

Since the imposition of Western culture on our community, the Mohawk people have been subject to drastic change in their daily diet. First, many community members have moved away, not just from their home territory, but from their traditional lifestyle and food sources. There they are eating the fatty and carb-heavy alternatives that are convenient and cheap, whether from chain restaurants or other seemingly economical options. Second, the fast-paced, consumption-oriented lifestyle now everywhere is still very new to our culture. Healthcare workers, particularly those involved from a diabetes prevention/management point of view state, observe that the people of Akwesasne are practicing less and less the holistic and traditional approaches to medicine. Our people increasingly have come to accept the disease that comes with westernization and western ideas about health. We become used to taking pharmaceutical drugs to combat metabolic and diabetic disorder, rather than look for answers in our traditional approaches to health.

CHECKUP FREQUENCY IN HEALTH & DENTAL

It is apparent that community members, particularly men, do not see a doctor regularly. This of course contributes to poorer health outcomes. Many factors may be in play with this behaviour including: pride and the desire to show strength; a genetic predisposition that allows Mohawks to actually handle pain better than others; the absence of a male doctor within the community. Again, lack of options for public transportation also plays a key role in this exacerbating this unfortunate infrequency of interactions with health and dental services.

HEALTHCARE SYSTEM DISCONNECTION

Further difficulties arise from the complicating reality that Akwesasne people and their families —though one community of Mohawks — live in 3 jurisdictional areas: Ontario, Quebec and the state of New York where they are dual-citizens. It is not hard to imagine the complications this causes our own internal health care efforts: having to interact with three separate systems none of whom are recognized for ease of use. Our people may be using health and dental services from multiple institutions located in different jurisdictions. And so we find many of our health client's records to be inaccurate and/or incomplete. This causes an overall lack of transparency, and makes difficult our ability to even assess where we are as a community health wise. Issues in terms of data consistency, information collection and information aggregation make it difficult to even begin to interpret the overall system's performance in a holistic way. How will we



find insights worth acting upon without good information?

The poor state of record keeping caused by these overlapping jurisdictions is extremely straining on healthcare professionals. These folks are trying to help and are striving to accurately diagnose the individuals they see. But they just don't have the basic information of an accurate medical history to work with. We need to give our health care professionals, and the people themselves, complete and accurate baseline health records. Knowing where we are as a system and as individuals is key to knowing where to go and whether we are heading in the right direction. Health assessment is based on measurable data, and the health of the system is based on measuring the improvement in outcomes. Improvements and consolidation are needed in the medical records of our people. We cannot expect that this improvement will be provided by the three medical systems we deal with. This centralization will be something we need to build ourselves. It will be important in our battle to reduce new cases of diabetes in our community.

LOSS OF TARGET DEMOGRAPHIC FOLLOWING PRIMARY SCHOOL

Individuals from 12-25 are our primary target demographic for preventing new cases of diabetes. When this cohort are in our community and in school on the reserve, The Department of Health has the opportunity to educate them. Given our people's increased susceptibility to metabolic diseases and diabetes, we have to act

proactively with our young people to prevent new cases. Akwesasne is home to three Akwesasne Board of Education Elementary (AMBE) Schools. These schools include Ahkwesahsne Mohawk School, Kana:takon School, and Tsi Snaihne School. While in school our children receive instruction about nutrition and health promoting lifestyles, learning to make habits of healthy choices. Following graduation from our schools, however, our students only secondary schooling options are off reserve. Our losing access to them following primary education means we have lose our opportunity to continue training them for long term health. This insight identifies a barrier we target to overcome.

GOAL OF INSIGHTS

Our goal of identifying insights is to better define the problem(s) and understand what are we really trying to solve. Insights set the stage for idea generation. But before we generate ideas we use an interim step to reframe insights as questions.

The How Might We framework is particularly effective for inspiring creative solutions for two reasons:

1. Its phrasing implies that a solution is possible.
2. It's often easier to craft solutions when you're trying to answer a specific question.

Collaboratively with zu, we crafted How Might We Statements. These are intended to create a road map that will lead us to generate new ideas to help the Akwesasne community.



Our How Might We Statements included:

- How Might We reduce the time and distance to healthy food?
- How Might We create a solution that bridges the gap between traditional and modern medicine?
- How Might We make people feel more comfortable discussing sensitive topics with health care professionals?
- How Might We maintain health education and contact with our people through High School?
- How Might We motivate people to take advantage of existing programming?
- How Might We encourage people to get screened for pre-diabetes earlier?



'How Might We' Statements being explored during Akwesasne community workshop

3. Come up with some ideas for solutions

Referencing our How Might We Statements, our next step was coming up with ideas to solve them. There's seemingly no end to the number of ways to approach idea generation (aka brainstorming or ideation). Ideas can be generated individually, as a group, or both. Ideas for solutions can be written, drawn, built in 3D, acted out, etc. The key is to focus on generating lots of possibilities, not necessarily trying to find the silver bullet solution right off the top.

Using a combination of individual and group ideation tends to result in the best solutions because:

- Individuals working alone can focus their thoughts to come up with more fully formed ideas.
- People working in a group can then use the individual ideas as springboards to evolve their own idea, build on another's idea, or come up with more new ideas.

In a small group session with health care professionals, council representatives and community members we began writing, drawing, and acting out solutions. This resulted in nearly a hundred different solutions to the above How Might We statements. We derived solutions that would make food and healthcare more accessible through various approaches including transportation improvements, diabetes prevention education (choice), cooking classes (variety). We had ideas regarding increasing programs offered that promote healthier lifestyle and provide



fitness resources, including tweaking our competitive nature with district games, where individuals compete against one another in sport and art. We envisaged anonymous helplines for health care advice and direction. We identified the implementation of greenhouses as a good idea: they are increasingly practical to operate; they would be an educational enhancement if associated with our schools; they would increase our accessibility to healthy produce. Additionally, moving our agriculture into greenhouses would decrease our exposure to toxins in the food we have no choice but to grow in our now polluted soil.

This group session produced over a hundred ideas. Participants were energized by the opportunity to develop their own ideas, to build on another's idea, and to see their idea taken further than they imagined when the whole group contributed on theirs. We saw useful innovation happen and produce good ideas. We used Design Thinking approaches to make choices as a group. We voted on favorites to focus down on the best of the hundred. We took the finalists further and worked until these most viable ideas became prototypes.

4. Try ideas out

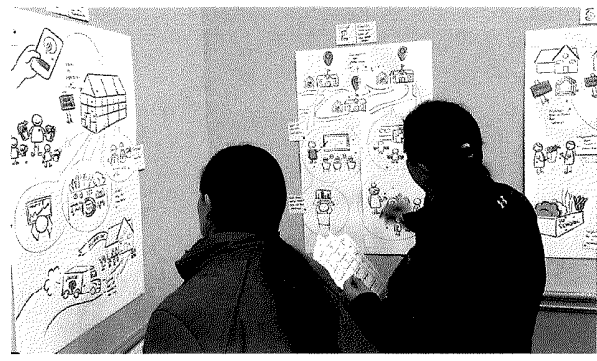
Prototyping possible solutions is the least expensive way to fail, and the fastest way to learn. Prototypes can be digital, paper, or a combination of any kinds of materials, sometimes looking like arts

and crafts. Participants can prototype a process, a pamphlet, a script. From our ideation session, we sketch-prototyped, and digitally-prototyped several concepts based on ideas we had discovered in the stakeholder engagement from our workshop.

SMART GREENHOUSE SYSTEM SKETCHED-PROTOTYPES

Through our workshops it was evident that the implementation of a Smart Greenhouse System was crucial to bringing healthy, affordable and accessible food to the community. To determine a strategy which would create the best benefit for our community, we narrowed the options down to three:

- 1 Large Community Greenhouse supporting all districts
- 3 Medium Community Greenhouses supporting each district
- Several neighbourhood operated community greenhouses supplying the homes in those neighbourhoods.

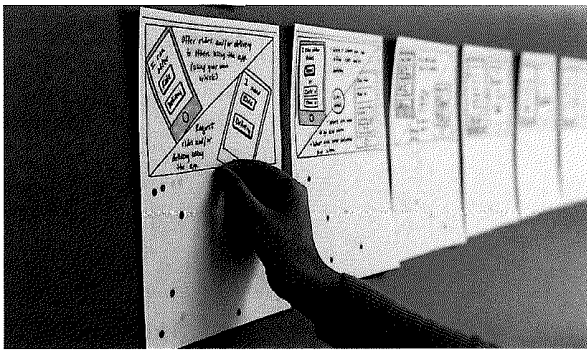


Smart Greenhouse System Prototype during community engagement

ELECTRIC TRANSPORTATION SYSTEM SKETCHED-PROTOTYPES

Likewise, our ideation workshops made us aware that some form of transportation system in the community was going to be necessary to our Smart Cities approach. This led us to prototype multiple concepts to potentially solve this clear barrier to many of the issues we identified as insights. These transportation solutions included:

- Ride-Sharing System connecting individuals who can offer rides with individuals who need them.
- MCA operated and subsidized Smart Taxi Service



Electric Transportation System Prototype during community engagement

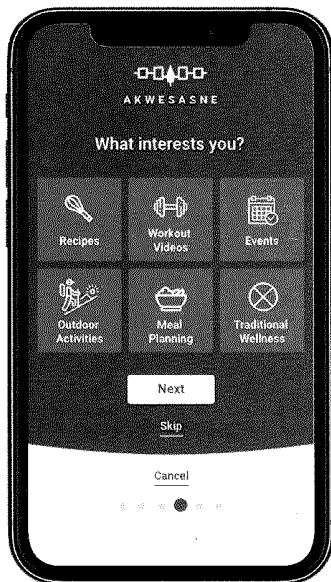
AKWESASNE MOBILE/WEB APPLICATION DIGITAL PROTOTYPE

In the finalist phase, a goal for the combined team was to create a working prototype of the Akwesasne Community Application. The application will allow the necessary communication and coordination for the whole Smart Cities approach to work, like glue for all the parts. Prototyping is a major milestone in the Design Thinking approach to building a product or service,

as it is the artifact representing the culmination of all the previous work, and is a clear target for what the next stages seek to create. So, following Design Thinking exercises with users where features were developed by users, early versions of our application prototype was created by our partners (zu) in AdobeXD. This online, interactive version of our app allowed community members to navigate through its functions using their devices in ways close to having a working application.

This digital prototype, a replica of the application, demonstrates initial sign up and login screens, as well as 4 tabs: Wellness, Nutrition, Fitness, and Community. Sub menus for these tabs each bring additional screens showing how these new opportunities to Akwesasne will work. The application, which is expected to expand in capability over time, provides room for expansion of functionality in future phases. With extensive engagement and feedback from the community to ensure proof of concept, followed by cycles of iterative prototypes produced and shared with each round incorporating feedback followed by more user-testing – we produced a prototype interface. On the following page is a link to the the Akwesasne Community Application prototype.





**CLICK THE LINK TO
VIEW THE PROTOTYPE**

<https://adobe.ly/2ERy3X3>

- Features and functionality of prototype include:
- Login screens with terms of use, privacy policy including collection, use, and disclosure messaging
- Ordering and payment of the Smart Delivery Service (for food deliveries from the Green Food Bag and Smart Greenhouses)
- Requesting and payment of rides from the Electric Public Transportation System

- Traditional and modern health resources in the forms of videos, blogs, podcasts, and recipes
- Booking of traditional, holistic and community healthcare appointments
- Access and storage CANRisk survey results, with prompts to take necessary action
- Compete in activities alone, or with friends in order to gain rewards
- Events and programs page to stay up to date and aware of opportunities in the community

5. Get some feedback

Getting feedback from our community on these more mature prototypes was the next critical step to ensure our solution would meet their expectations. The majority of our this wider community feedback and user-testing would be completed at our community engagement events.

We were aware of the lack of transportation limiting participation for many. So we made sure to host community engagement events in each of the three districts so there was ample opportunity for everyone to contribute to our Smart Cities Solution. For both the Smart Greenhouse System and the Electric Public Transportation System, we used a multifaceted approach to get good feedback from users. We mobilized a number of strategies:

Interviews - Members of our team and zu's were stationed around the meeting space in



order to answer questions, pose their own questions back to users and to follow up to enquire why certain notes were given or decisions made.

Dot voting - Allowed community members to simply leave adhesive dots on parts of the solution sketch they really liked or approved of.

Feedback Notes - Gave users the opportunity to provide feedback by writing comments on adhesive notes and sticking them anywhere on the sketches. Their comments led to other participants also dot voting on the stickies themselves, giving approval or making further suggestions, all in a casually collaborative and efficient way.

Voting box - With multiple concepts and many participants, we simply wanted to give individuals the ability to vote for their overall favourite concept. This gave us an idea of which concept would be likely to benefit the community the most, and so be adopted for actual use by them.

This resulted in a more flushed out application prototype that we were extremely excited to get it into the hands of our users. Gaining feedback on this now more mature prototype came through a number of methods:

1:1 user testing - Members of the zu team had community members work with the application under one of our team's observation. This provides some the highest quality insight into the apps success in the presentation of features and functionality.

Dot Voting - As in our previous use of dot voting on interface sketches, we now made printouts of the application screens, taped them to the wall and encouraged community members to vote on their favourite features.

Feedback Notes - Feedback notes gather more specific insights, new ideas and enhancements — then just votes. And participants enjoy the ability to leave feedback and suggestions right next to interface features, and to see what other folks are saying. This is a high quality feedback method providing insights very useful to the designers.

Interviews - Members of our team and zu's were again standing ready to answer questions, and to engage in brief conversations to clarify exactly the nature of the participants opinion, idea or critique.

Getting feedback on our prototypes was in essence just more research. We gathered information about how people use the solution, where they stumble, what they liked, what they disliked, and things we can make better. Design Thinking has led us to a Smart Cities Solution that we can confidently say was designed and created by and for the community using it. This engagement with users is the missing step in so many software projects that fail. Our extensive efforts in community engagement on the app greatly increases our potential for success.



Data & Privacy

PRELIMINARY PRIVACY IMPACT ASSESSMENT (PIA) OR PRELIMINARY RATIONALE ANALYSIS (PRA) WITH EVIDENCE THAT RELEVANT PRIVACY AUTHORITIES WERE CONSULTED AND THEIR GUIDANCE WAS CONSIDERED IN ITS DEVELOPMENT

Following an in-depth analysis of our Smart Cities Challenge solution(s), and multiple meetings with the Privacy Commissioners of Canada, Ontario, and Quebec, we are confident in taking the appropriate measures to ensure the minimization, anonymization, consensual and security in the collection, use and disclosure of information. To both implement and maintain an effective future-proofed solution, while constantly measuring our progress, a number of PII and non-PII data points will need to be collected. Within our PPIA, we highlighted ways in which we intend and commit to comply with the Personal Information Protection and Electronic Documents Act.

Types of methods of data collection, generation, analysis, storage and transmission, and plans for re-use, re-distribution, derivative production, archiving, and preservation that reflects the entire data lifecycle in project design.

As members of the communities ourselves, and proud of Akwesasne individualism, we approach the collection, generation, analysis, storage, and transmission of data as if it were our own.

Collected - Personal information will be collected within the application through. This data will be gathered anonymously from inception and in aggregated form to gain insight into the progress of the community. Collected information will include personal information, aggregated information, and device information.

Personal Information - Full name, Home address, Email address, Credit Card Numbers, Age Range, Telephone and Login Details. This information is fully encrypted at first point of contact, in transit and at rest.

Aggregated Information - Gender, Race, Age Range, Workplace, Height & Weight, BMI, Waist Circumference, Physical Activity Levels, Diet, Fruits and Vegetable Intake, Blood Pressure, Blood Sugar Levels, Family History in Relation to Diabetes

Device Information - Device IDs, Internet Protocol (IP) address, Unique Device Identifier, Cookies tracking, and Location Tracking (While using the app)

Adept in the security of information, our partners, zu, have been ensuring the safe



disclosure of information for over 23 years. All data surfaced and in transit between the application and Mohawk Council of Akwesasne Servers, will be managed through;

- SSL encrypted communication for all data in transit.
- Credentialed access to sensitive information at all touch points.
- Strong, AES encryption of sensitive data at rest.
- Secure, off-site storage of data backups
- Logical, and physical separation of collected PII and de-identified, aggregate data that will power community dashboards and open data initiatives.
- An extract, transform, load (ETL) step to pull data from the community application database into a separate repository of information used to generate redistributable reports that are devoid of PI.

Use - The use of the collected information will ultimately allow us to measure the success of our Smart Cities Solution. It will provide us insight into the communities progress enabling us to adapt our approach in areas of low participation and capitalize on areas of high participation. All information will be fully encrypted through SSL, and in an aggregated form to not tie information to an individual or key identifier.

Disclosure - All information not highlighted as aggregate information, will be fully

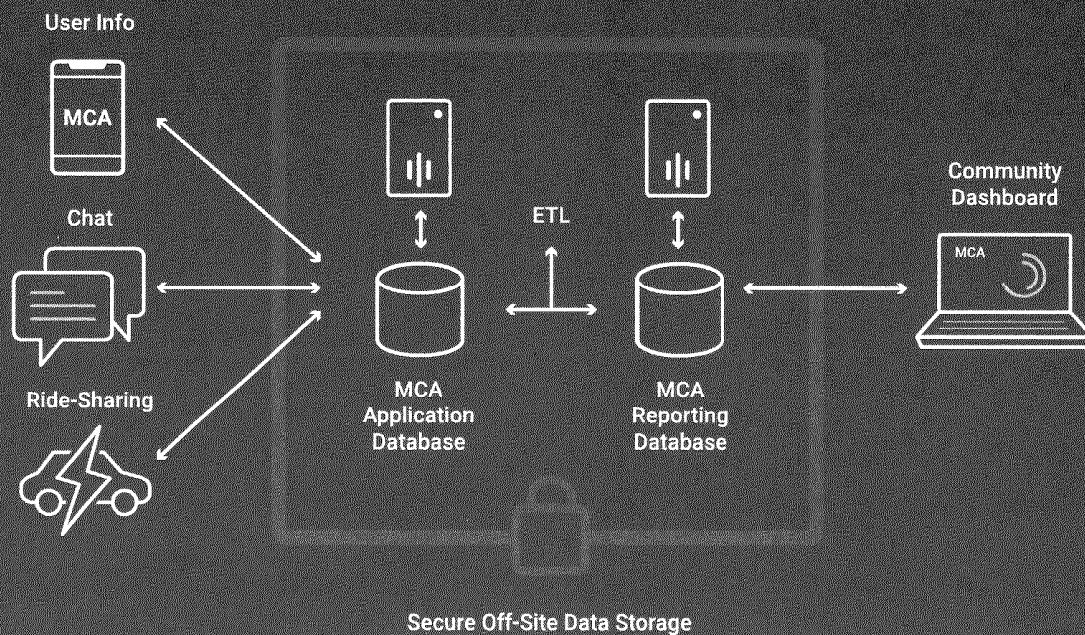
encrypted and untied to the individual at initial contact, in transit and at rest. Personal information will not be made available to any third parties but only Mohawk Council of Akwesasne internal trend analysis and measurement

Efforts made to integrate security and privacy considerations into project design, particularly those that were raised users, residents, and other stakeholders.

Balancing design standards, user experience, and the privacy implications resulting from the former are all considerations necessary for the implementation of our Community Application. Below we highlight several best practices to integrate security and privacy considerations into our project design.

- Identification of what personal information is being, or may be, collected about them at time of consent
- Identification of all purposes for which information is collected, used or disclosed at time of consent
- Provide information to individuals in manageable and easily-accessible ways
- Multi-Factor Authentication
- "Just-in-Time" privacy notice where possible
- Treating consent as a dynamic and interactive process.
- Be positioned to demonstrate - either in the case of a complaint from an individual or a proactive query from





Data Flow Diagram

a privacy regulator - that we have a process in place to obtain consent from individuals.

- Obtain consent from a parent or guardian for any individual unable to provide meaningful consent themselves
- The ability of an individual's right to withdraw consent
- The ability of an individual's right to review and update personal information logged



Budget & Project Breakdown

zu's projects are tracked hour by hour, day, by day, week by week and month by month. Their time tracking system called Replicon records their time in 15-minute increments. The time spent is fed into burn and resource charts that are scrutinized against detailed work plans produced at the beginning of each production phase and broken down further by each week by zu's experienced product owners. The PO's work with zu's designers and developers to further break down work on key features into bite-sized "user stories", that are then used to create tasks in Jira and Replicon for assigning work and recording time respectively.

The Akwesasne team is kept in the loop via zu's weekly progress reports that feature a cost breakdown to date, budget forecast for the week ahead and expected spend upon completion. Risks are flagged in the report and discussed in weekly production meeting with the Akwesasne team. A decision log is kept by zu to maintain

transparency throughout the project. Between their time tracking system, weekly reports and weekly status meeting, we'll be kept informed of risks, spend totals and decisions to ensure proper cost control from kickoff to launch. Work is completed upon our approval with production billing rate of \$140/hr and a standalone strategy rate of \$175/hour.

Our Smart Cities Solution will be assembled using, really no experimental technologies or untested software approaches. Therefore, our estimates are straightforward and not based on speculative math. Nevertheless, public tenders under the oversight of the before mentioned committees should provide us with competitive prices for the equipment and installation of the equipment we need to build the Electric Public Transportation and Smart Greenhouse Systems.



APPLICATION & DASHBOARD	HOURS	SUB-TOTAL
Phase 1: Strategy & Validation Stage	150	\$175,875.00
Phase 2: Design	230	\$273,000.00
Phase 3: Development	355	\$509,250.00
Phase 4: Dashboard Development	240	\$252,000.00
Subtotal	975	\$1,210,125.00
With contingency 10%		\$1,331,137.50
Taxes (11%)		\$146,425.13
Travel Costs & Expenses		\$75,000.00
Application & Dashboard Implementation Total		\$1,552,562.63

GREENHOUSE IMPLEMENTATION ESTIMATE	SUB-TOTAL
Greenhouse Engineering and Design	\$150,000.00
Ahkwesahsne Mohawk School Greenhouse	\$300,000.00
Kana:takon School Greenhouse	\$300,000.00
Tsi Snaihne School Community Outreach Greenhouse	\$450,000.00
Curriculum Specialist (3-Year Term)	\$240,000.00
Subtotal	\$1,440,000.00
Taxes (11%)	\$158,400.00
Greenhouse Implementation Total	\$1,598,400.00



ELECTRIC TRANSPORTATION SYSTEM ESTIMATE**SUB-TOTAL**

Electric Cars (12 x \$45,000 each)	\$540,000.00
Electric Car Charging Stations (6 x \$5,000 each)	\$30,000.00
Natural Resources Canada Rebate	(\$15,000.00)
Electric Bus	\$300,000.00
Subtotal	\$855,000.00
Taxes (11%)	\$94,050.00
Transport System Implementation Total	\$949,050.00

OVERHEAD COSTS

Project Coordinator Salary - 2 Year Term	\$200,000.00
Project Assistant Salary (x1) - 2 Year Term	\$150,000.00
Greenhouse Interns (x3)	\$150,000.00
Driver Wages	\$100,000.00
Subtotal	\$600,000.00
Admin Management (10%)	\$60,000.00
Taxes (11%)	\$72,600.00
Overhead Total	\$732,600.00

PROJECT COSTS

Application & Dashboard Implementation Total	\$1,552,562.63
Greenhouse Implementation Total	\$1,598,400.00
Transport System Implementation Total	\$949,050.00
Overhead Total	\$732,600.00
Project Total	\$4,832,612.63



FINALIST GRANT EXPENDITURES

zu Strategy & Design Consultation	\$176,200.00
Community Engagement Events	\$29,500.00
Project Coordinator Salary	\$8,000.00
Travel	\$7,000.00
Subtotal	\$220,700.00
Taxes (11%)	\$24,277.00
Expenditure Total	\$244,977.00

* Remainder of budget will be used through the spring finalist stages, including presentation and travel

Implementation Phase Requirements

While our Challenge couldn't be more significant to our community, the proposed Smart Cities system does not require special attention in regards to either municipal, provincial, or federal legislation, nor for reporting or policy requirements. Our consultation with Indigenous groups, since this is ourselves, is about ensuring we are inclusive of the many voices of our community. To that end, we have relied on many types of engagement to determine our initial approaches, and as touchpoints at every step of the planning and process of solution delivery. The most complex areas of legislative impact are around personal data privacy, and the risks of trying to

build a comprehensive understanding of the state of our people's health. This is covered in our Preliminary Privacy Impact Assessment.

Community Employment Benefit

Our Smart Cities project will provide many benefits towards new skill development, as well as full and part time labour opportunities. Part of the value of these employment opportunities will be every participant knowing that the work they are involved in directly benefits our community and has the higher purpose



of improving health outcomes and quality of life at Akwesasne. The Electric Public Transportation System will create employment through MCA employed Smart Taxi drivers, and bus drivers. The Greenhouse will create opportunities for all ages and ability levels, providing positions in horticulture engineering, gardening, plumbing and electrical, as well as project and inventory management. Volunteers will also be needed and will receive exposure to trades and professions not currently in Akwesasne. The Akwesasne Community Application will also create numerous opportunities. Our Mohawk Council of Akwesasne Information Services team will undoubtedly need more help, and will towards those graduating from Ontario Emerging Jobs Institute for applicants. Hosting, maintaining and enhancing a combined mobile and web-based application like the Akwesasne Community Application requires all manner of skills. These include programming for all the devices and frameworks in use, database management, server management, system security and privacy, CMS management, social feed integrations, location management, training, and more. Some areas will require a depth of expertise, others will be necessary at shallower depths of experience. We are committed to not only innovating the products and services of our community but also developing the expertise and education of our people. It is time for us to make use of the technology that is key to our moving forward with our challenges and opportunities, and to become self-sufficient with these skills.

Commitment to a Climate Lens Assessment

Should we have the opportunity to move forward with the implementation phase, we will commit to completing the Climate Lens Assessment. This will make more sense after the public tenders for solution equipment have been received, and choices made about which equipment provides the best value at that future point in time. We are confident our Smart Cities approach will bring positive climate impact, but will confirm the expected measured effects when appropriate details for the analysis are available.

Risk in Regards to Implementation Plans and the Regulatory Environment

We do not foresee risks to our Smart Cities project in failing to meet relevant municipal, provincial, and federal reporting and legislative requirements. Granted there are always risks associated with making mistakes in regards to construction of buildings, and the Smart Greenhouses are structures. There are information privacy risks. There are labour standards rules. Their are employment related taxes to be paid. There is general reporting to the various Revenue Collection agencies. But none of these seem either notable as unique to our project, nor are new risks that our community does not already face.



Thank you for taking the time to read our proposal. We hope you have found our plans to improve the health of our people through this combination of Design Thinking, Smart Technologies and Web-based Software to be practical, achievable and worthy of being taken to fruition.

Our consultation
with Indigenous groups,
since this is ourselves,
is about ensuring we are
inclusive of the many
voices of our community.



Appendix A



SCHEDULE "A" to MASTER SERVICE AGREEMENT
STATEMENT OF WORK: SUPPORT AND OPTIMIZATION

RE: Website Support and Optimization Service Agreement between the Mohawk Council of Akwesasne. (the "Client") and zu.com Communications Inc. (the "Webmaster") dated effective the 30th day of September 2018.

Support and Optimization Overview

Retaining long-term value from any digital asset requires a commitment to supporting the software development lifecycle. The increasingly rapid pace at which web technology and best practices, online threats and user expectations evolve make it hard to keep up. Our support and optimization model is designed to keep MCA team members aware of issues affecting site health and security, opportunities for iterative enhancement and potential opportunities to leverage new trends or technologies.

We structure our approach to long-term viability in two ways. The support fee enables your website to be flexible and protected from the changing nature of technology and online threats while the optimization budget allows your website to evolve alongside your corporate and communications strategies. Together, these two approaches to health and optimization ensure the successful transformation of your digital asset over time.

Definitions:

Bug – A bug is defined as a defect or defects in the existing code that produces an incorrect or unexpected result.

Existing code – Refers to code in use at the commencement of support and optimization agreement.

Minor version – Point sequence updates to supported, dependent software. Ex. *major.minor*

Major version – Whole number sequence updates to supported, dependent software. Ex. *major.minor*.

Schedule A: Budget

Annual Support Budget: Fixed TBD broken into a TBD monthly fee.

Monthly fee includes the services outlined in Schedule B: Support Services. The scope of services will be evaluated annually from the initial start date as the website may grow and the scope of support services and fees may be expanded.

Annual Optimization Budget: Recommended TBD broken into a TBD monthly forecast.

The annual optimization budget will include the variable costs dedicated to building out new features, website enhancements and major system upgrades discussed in Schedule C: Optimization Services. Optimization work will only be completed upon client approval at a production billing rate of \$140/hr and a standalone strategy rate of \$175/hour.

*Any changes in costs as a result of changes to hosting arrangements at the request of the client will be reflected in changes to the monthly fees.

*Variable cost will be affected based on US dollar conversion and hosting usage.

200-303 Pacific Avenue zu.com
Saskatoon, SK : 306.653.4747
S7K 1P2 : 306.653.4774



* Any work related to hosting maintenance including server configuration, server maintenance and host provider management will be recorded hourly and billed to the optimization budget at a rate of \$140/hr.

Schedule B: Support Services

Support Services Scope:

1. Monthly proactive performance testing and bug diagnosis
 - a. New minor version and major version browser/OS testing and 3rd party integrations monitoring for updates or security issues.
 - b. Run any automated tests as well as manual testing per code release.
 - c. Generate bug report; prioritize non-urgent bugs; catalogue major version browser and OS issues for optimization.
2. Bug resolution
 - a. Bugs will be catalogued and prioritized based on services levels outlined in Schedule D.
 - b. Bugs will be fixed based on priority.
 - c. Minor version browser/OS and 3rd party integrations bugs will be resolved under the fixed support fee outlined in Schedule A.
 - d. Major version browser/OS and 3rd party integrations upgrades covered under optimization budget outlined in Schedule A.
3. 3rd party integrations support
 - a. Any fixes required to ensure 3rd party integrations are up to date, secure and functioning.
 - b. 3rd party integrations may include:
 - i. Google Maps
 - ii. YouTube
 - iii. Google Analytics
4. Drupal Support
 - a. Minor version updates and security patches
 - b. Deployment support



- c. Administration View bug diagnosis and resolution
- d. Additional local environment setup for ensured redundancy

5. Quarterly Services Reporting

- a. Incident tracking and diagnosis
- b. Analytics review
- c. Document major risks
- d. Document known 3rd party feed updates or enhanced feature availability
- e. Document new browser/OS and device releases

6. Supported Browsers and Devices:

Monthly Testing - We currently test for the following operating systems and devices:

Device	Versions	OS
iPhone	SE, 8, 8+, X	iOS 11.0+
iPad	Mini, 4th Gen, Pro	iOS 11.0+
Android Phone & Tablet		Android 6.0+

Note: A review of website traffic by browser and OS will be conducted to determine whether backwards compatibility is required. If any one browser or OS makes up more than 10% of the overall traffic, zu will ensure the website is optimized for that instance.

Browser	Versions
Internet Explorer	11.0+



Safari Latest version

Firefox Latest version

Google Chrome Latest version

Schedule C: Optimization Services

While Support Services ensures asset health, Optimization maintains relevancy, strategic alignment and future growth opportunities. If assets are left stale they will never achieve the long-term value intended for the business or users. We recommend a balance between investing in system upgrades and feature enhancement to keep pace with the evolving nature of web technology and user expectations.

1. Website optimization:

- a. Custom feature development
- b. Section or website-wide content updates
- c. Major version Drupal upgrades (ie. 8.0 – 9.0)
- d. Additional 3rd party tool integration, API development, microservice integration
- e. Production design elements
 - i. Infographics
 - ii. Data visualization
 - iii. Print materials
 - iv. Heuristics reviews
- f. Website template adjustments
- g. Website main navigation changes
- h. Strategy services: user testing, stakeholder engagement, design sprints, product design, and development

2. Microsite development and optimization:

Mohawk Council of Akwesasne : Support & Optimization Agreement



- a. Additional microservice websites for campaigns or special needs
- b. Development of additional websites such as a dark site for crisis communications, community websites, further form integrations

Schedule D: Service Levels

zu business hours are 8:30 AM – 4:30 PM, Monday-Friday

Team - The developers responsible for performing support services include senior zu team members including one Acquia Drupal certified developer.

Urgent Requests:

1. Impact on all users on given platforms.
2. Website or application is non-functioning or severely degraded.
3. Loss of functionality to an entire section of the website.
4. Notice must be emailed to MCA@zu.com to ensure all members of the production team and support staff are notified.
5. zu will respond within one (1) hour with an estimated timeline to address such a request within business hours.
6. Urgent requests will be resolved at the earliest possible time and as quickly as possible. The team will work continuously until a resolution is met.
7. Urgent requests brought about by actions of the Mohawk Council of Akwesasne, its host provider or 3rd party participants will be resolved. Billing costs associated with these issues will be reviewed on a case by case basis and possibly fall outside the support services budget.
8. Should an urgent request be identified and communicated to zu outside of the stated business hours, and should the issue be deemed unable to be mitigated through a short-term rollback, zu Operations will then assess the next steps on a case-by-case basis in consultation with the Mohawk Council of Akwesasne to determine an appropriate resolution.

Non-urgent requests:

1. Impact on one (1) or more user groups or any device platform.
2. Application continues to work but non-critical functionality is unavailable. Restoration is not time sensitive.
3. Application continues to work but little non-critical functionality is unavailable.
4. Request is made in Zendesk or, if Zendesk is not being leveraged, a request is emailed directly to the Product Owner PO.



5. Response within eight (8) hours on a timeline for an estimate within business hours.
6. Non-urgent requests will be prioritized and resolved based on a mutually agreeable schedule.
 - a. This doesn't include downtime that might occur due to the host provider.

MCA Responsibilities:

1. Grant zu access to MCA's facilities, information technology infrastructure, information and data, and personnel for the provision of the services.;
2. Maintain backup data, and perform all other tasks required or recommended by zu to prevent or mitigate any loss or damage to MCA's data or other information arising out of the provision of the Services;
3. Comply with all reasonable procedures and requirement of zu to facilitate and assist in the provision of the Services
4. Perform those tasks assigned to MCA conscientiously and using qualified and competent personnel;
5. Active communication with the zu team, and bi-weekly meeting attendance;
6. Drupal CMS content authoring & publishing, including;
 - a. The editing of existing and addition of new content and documents
 - b. Creation of new pages using existing content and page types
 - c. Management of Content Menu Settings and URL Paths
 - d. Rearrangement and addition of menu items

Schedule E: Quarterly Performance Reporting

Availability (Current Month; Previous Month; YTD):

- * Service Time
- * Unplanned Downtime Duration
- * Maximum Downtime Duration
- * Number of Downtime Occurrences
- * Total Page Failures

User Experience (Current Month; Previous Month; YTD):

- * Average Response Time
- * Maximum Response Time

Capacity (Current Month; Previous Month; YTD):

- * Average User Capacity
- * Maximum User Capacity

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- Completed Pages
- Bandwidth Consumption

Performance (Current Month; Previous Month; YTD):

- Average CPU Usage
- Maximum CPU Usage
- Average Latency
- Total Page Hits
- Average Page Load Time
- Maximum Page Load Time

IN WITNESS WHEREOF the parties hereto have executed this Statement of Work to be effective as of the 1st day of January 2019 ending the 31st day of December 2019.

Mohawk Council of Akwesasne

zu.com Communications Inc.

Per: _____

Per: _____

Title: _____

Title: _____

Signature: _____

Signature: _____

Mohawk Council of Akwesasne | Support & Optimization Agreement



Appendix B





Akwesasne Area Management Board

P.O. Box 965
Cornwall, Ontario K6H 5V1
Tel: 613-575-2626 Fax: 613-575-2863 www.aamb.ca

March 4, 2019

Rhonda Adams,
Manager, Information Services,
Mohawk Council of Akwesasne,
PO Box 579,
Cornwall, Ontario
K6H 5T3

She:kon Rhonda,

Thank you for your email concerning the Akwesasne Smart Cities Proposal. I have been watching the development of this initiative with great interest given the tremendous possibilities and benefits Smart Cities could have for Akwesasne.

The Akwesasne Area Management Board (AAMB) would be pleased to participate in the Smart Cities Proposal by becoming a partner in training and employment opportunities. The AAMB offers a variety of programs and services that could dovetail with Smart Cities including Internships; Training on the Job (Job Opportunities); and Youth Initiatives to engage young people. Our goal is to work with employers to expand the range of opportunities for Akwesasne workers and clearly the initiatives proposed in Smart Cities would match this objective.

The Akwesasne Area Management Board looks forward to receiving more information on the Smart Cities proposal and extends best wishes on the development of this important program.

Skennen,

AKWESASNE AREA MANAGEMENT BOARD

Russell Roundpoint,
Executive Director.



Saint Regis Mohawk Tribe

Amberdawn Lafrance
Saint Regis Mohawk Tribe Environment Division
Akwesasne Cultural Restoration Program

March 4, 2019

Rhonda Adams
Project Lead Smart Akwesasne
Manager Information Services
Mohawk Council of Akwesasne

Dear Rhonda Adams:

I am writing to voice my full support of the Smart Akwesasne Project and their proposal to the Smart Cities Challenge.

The Saint Regis Mohawk Tribe's Akwesasne Cultural Restoration (ACR) Program was established in 2013 as a result of the St. Lawrence Environment Natural Resource Damage Assessment Settlement. The name that we have chosen for ourselves in our language is "Áse Tsi Tewá:ton" which means "make it new again". This name and its meaning describe what we are doing for Mohawk culture through the program; we are making it new again, and bringing new life to our traditions and cultural practices and strengthening the connection of our people to the land. The program is overseen by the Akwesasne Restoration Commission which is made up of representatives from the community, the Mohawk Nation Council of Chiefs, the St. Regis Mohawk Tribe, and the Mohawk Council of Akwesasne. The main component of "Áse Tsi Tewá:ton" is the Cultural Apprenticeship Program which is a four-year program in traditional, land-based, cultural practices. We hired eight Cultural Practitioners in the categories of Water, fishing and the use of the river; Horticulture and traditional foods; Medicine plants and healing; and Hunting and trapping. The program graduated 13 apprentices in 2017 and held over 150 community workshops since 2014.

Two goals of the Smart Cities proposal can be directly supported by the ACR program: Greenhouses and Cultural Awareness. The ACR program has the resources to offer traditional teachings related to Indigenous food sovereignty, Haudenosaunee heirloom seed saving, traditional gardening and harvesting practices, Kanien'keha language, and curriculum centered on these teachings.

Sincerely,

Amberdawn Lafrance
ACR Program Manager

71 Margaret Terrance Memorial Way
Akwesasne, New York 13655
Phone: (518) 358-2272
www.srmt-nsn.gov



**Akwasasne Freedom School
Via Mohawk Nation**

P. O. Box 290
Roosevelt, NY 13683

TL: 518-358-2073

office@freedom-school.org

P. O. Box 1832
Cornwall, ON
K6H 5R7

To: Infrastructure Canada Smart Cities Challenge

**From: Kanerahtens Tara Skidders
Akwasasne Freedom School Office Manager**

Re: Proposal on Curriculum Development for Greenhouses at schools

Date: March 1, 2019

Tekwanonhweratons (greetings),

I hope this letter reaches you in good health and spirits. I am writing on behalf of the staff, students and families of the Akwasasne Freedom School. We are in support of this program and hope that it will help to build on what we have already created and follow. As Onkwehonwe (native) we have always been instructed to grow our own food for the nourishment and health of our body, mind and soul.

This proposal is absolutely necessary for our youth and families of Akwasasne. Students need the opportunity to learn where their food comes from as well as the work that goes into growing the foods. There is a plethora of knowledge to be shared which covers all subject areas such as science, health, math, social studies and cultural practises. This curriculum will be taught in English and Kanien'keha (Mohawk) which will strengthen language revitalization efforts for the immersion schools and create much needed curriculum. Immersion teachers are often creating their own curriculum for their classes because it is not written in the language needed. This will help alleviate the extra work that these teachers have.

We look forward to being part of such an important project in the near future.

Niawenhko:wa (thank you very much),

Kanerahtens Tara Skidders



March 1st, 2019

To Smart Communities Challenge Reviewers:

I am writing on behalf of Canadian Organic Growers (COG) to support the tremendous environmental and economic benefits of the SMART Akwesasne application.

COG is a registered national charity (13014 0494) and an organic farm and consumer membership organization with over 1,000 members and supporters. Since 1975, COG has engaged in farmer education, policy work and sector development and has offered a united voice for producers who practice organic agriculture.

Eric Payseur, COG's manager for an exciting new initiative called *Growing Eastern Ontario Organically*, has toured Akwesasne and examined the potential for transforming the community and community health outcomes through food.

We are in discussions to partner with Akwesasne to provide culturally appropriate training and education resources for the community regarding organic agriculture and food production. We have discussed remediation of land from industry contamination, maximizing the sustainability of existing land and food production infrastructure, the production of heritage seeds, supporting public health, and engaging youth in the green jobs of the future. We are particularly excited about the APP for bartering locally produced food, and the potential to connect with the Food and Agriculture Mapping project of Stormont-Dundas-Glengarry Counties to increase food tourism in the region and sell surplus to the surrounding communities. Our consulting/training for greenhouse or land-based agricultural production, or

our nature is organic - le bio, au coeur même de notre nature

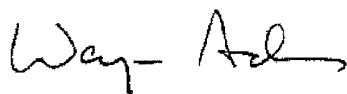
Canadian Organic Growers | Cultivons Biologique Canada
410-100 Gloucester Street · Ottawa · Ontario · K2P 0A4
1-888-375-7383 (Canada) · (613) 216-0741 · Fax (613) 236-0743
office@cog.ca · www.cog.ca

value-added food preservation, production and marketing will allow Akwesasne community members to become food secure and tap into the economic benefits of an almost \$6 billion Canadian organic industry.

Despite its problematic location across 4 provincial or national borders, certified organic production and value-added foods present incredible environmental and economic opportunities to the people of Akwesasne. SMART Akwesasne would be situated in a tremendous synergy centred around agriculture, agri-food, and positive environmental initiatives in Eastern Ontario; the Canadian Organic Growers and its other Eastern Ontario partners will be a key resource for implementing this initiative.

I know there are many communities vying for your financial support in order to make their ideas happen. However, I believe the changes here will have the greatest possible benefit imaginable. If you have any questions or would like me to elaborate further, please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Way- Adams", with a stylized flourish at the end.

Wayne Adams
Executive Director
Canadian Organic Growers

**Page 1584
is withheld
pursuant to paragraph
20(1)(b), 13(1)(d) and 19(1)
of the *Access to Information Act***

**La page 1584
Font l'objet d'une exception totale
conformément aux dispositions de paragraphe
20(1)(b), 13(1)(d) et 19(1)
de la *loi sur l'accès à l'information***

**Page(s) 1585 to 1594
are withheld
pursuant to paragraph
20(1)(b) and 13(1)(e)
of the *Access to Information Act***

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20(1)(b) et 13(1)(e)
de la *loi sur l'accès à l'information***

**Page(s) 1595 to 1596
are withheld
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19(1), 20(1)(b) and 13(1)(e)
of the *Access to Information Act***

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conformément aux dispositions de paragraphe
19(1), 20(1)(b) et 13(1)(e)
de la *loi sur l'accès à l'information***